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ELECTROTHERMIC METHODS IN THE TREATMENT OF MALIGNANCY.*

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BALTIMORE.

During the last 15 years, the successful treatment of cancer has been greatly facilitated by improvements in our physical methods, namely, radium, Roentgen ray, and the high frequency current. The chief therapeutic value of this last mentioned agent is due to heat, although a still unknown factor seems to be present. General surgeons have paid no little attention to heat in the treatment of cancer as a potent factor in destroying neoplastic cells without serious damage to surrounding healthy tissue and without a slowly healing indolent sclerotic ulceration, although it has not been universally accepted and used. The usual form of applying heat has been by means of hot objects. In this new method the heat is developed within the tissues as contrasted to the older methods such as the cautery.

Electrothermic methods include surgical diathermy, fulguration, endothermy, electro-desiccation, electro-coagulation, radio-knife, acusector, and several other allied forms. For the sake of brevity and clearness I will use the three terms electro-desiccation, electro-coagulation, and acusection.

Electro-desiccation, so named by Clark, is the dehydration of tissue due to the heat developed by the passage of a monopolar high frequency electric current. Electro-coagulation of Doyen is actual coagulation of tissue proteins caused by an intensely high heat generated by the passage of a bipolar high frequency electric current. In both desiccation and coagulation, the currents I employ are composed of damped oscillations of a frequency of about 1,250,000, and a wave length of about 240 meters, with a strength of 30,000 volts, and from 300 to 1500 milliamperes. In extensive coagulation, stronger currents may be used if desired.

Acusection (cutting with a needle) is a term applied by Dr. Howard A. Kelly to the endotherm knife of Wyeth. This instrument has been unwisely termed the radio-knife because the current is produced by passing a high frequency bipolar current through three electrode vacuum tubes (radio-tubes). The current here is of a higher frequency (1,500,000) than that of coagulation or decissation. The oscillations are of equal amplitude, it therefore being an undamped current. It has been shown experimentally that this current produces a molecular disintergration of the large protein molecules. This is accomplished by the continued bombardment of these molecules by equal oscillations. This smoother current than that of desiccation or coagulation produces very little heat.

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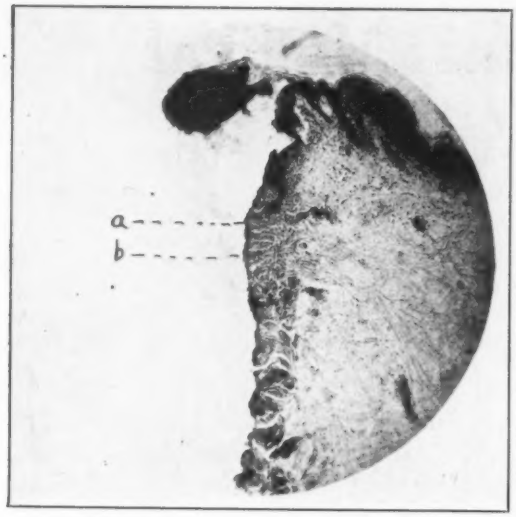

Fig. 1—Benign mole excised with endotherm knife; a. Zone of molecular disintegration; b. Zone of coagulation inside a; a and b measure together 0.1 mm.

HISTOLOGY.

I have had the pleasure of confirming microscopically the work of Drs. William L. Clark and E. J. Asnis of Philadelphia. The process in desiccation is, as the name implies, one of drying. The heat is not sufficient to cause marked changes in the cell structure so much as in the water content. The tumor cells are actually dried out. They are shrivelled and elongated with drawn out nuclei, but their cells characteristics are still discernible. The connective tissue stroma is also contracted and shrunken.

The current used in electro-coagulation has a higher amperage, giving a hotter, and more penetrating current. The effect is most marked in the epitheloid cells which are more sensitive to the action of heat. They lose their structure and present under the microscope a homogeneous granular debris. With the usual amount of coagulation, sufficient to remove a tumor, the stroma cells retain to a greater or lesser degree outlines of their cellular stucture; but here the changes are more marked than those found after dessication, and hyalinization is common. If the current is applied for a longer time, complete coagulation of all tissue, stroma as well as cancer cells, will be observed. The blood vessels are filled with clotted blood and their walls are coagulated thus accounting for the lack of bleeding.

The acusector severs tissue almost as quickly as the knife, leaving a faintly brownish seared appearance to the cut surface of the skin and muscle but no visible effect in the fat. On microscopical examination, one sees at the edge of the wound a faint line of carbonization behind which there is a thin zone of desiccated and coagulated tissue. The depth of penetration of this current, as seen under the microscope is one-tenth of a millimeter. With so little destruction of tissue, primary union is the rule.

TECHNIC.

The essential features of success in the use of electro-thermic method, are, first, a thorough foundation in surgical training, second, an accurate judgment as to the extent of the disease, and a thorough knowledge of the current being used and the extent of the after slough with the chosen current. These criteria are attained only by practice.

In using the bipolar currents for coagulation and acusection 2 electrodes are necessary. The inactive electrode is made of a piece of sheet metal or heavy wire mesh of a convenient size (8 by 12 inches) covered with asbestos and linen. This is covered with a small pillow case, moistened, and placed beneath the buttocks or shoulder of the patient. If one is operating with the patient in the knee-chest or perineal postures, as in treating bladder, rectal or cervical disease, a belt electrode may be strapped to the thigh or other convenient parts of the body. A convenient type of inactive electrode is one made of two pieces of felt covered with porous nickle-plated metal which can be strapped to the thigh or abdomen.

The active electrodes are made in many forms suitable for application of the current to any accessible portion of the body. Two general types are employed. The flat, or blunt electrodes, as first advocated by Doyen, and later employed by many men in this country, notably Corbus, O'Connor, and Kolischer, are made in the forms of various sized flat discs. In treating disease in cavities as the cervix and rectum, spherical and olivoid electrodes may be used. The sharp or needle electrodes is the one which I constantly use, feeling that it is under more accurate control than the others. One can always see the effect on tissue, can treat the minutest areas, or by moving the needle from place to place, large massive growths. In the latter deeper penetration may be obtained because the needle can be plunged to any desired depth.

For superficial skin lesions, an ordinary cambric needle is held in a suitable handle, provided with thumb-switch for quickly making and breaking the current. In treating malignant disease of the oral cavity, cervix or rectum, one uses straight electrodes, with as little metal exposed as possible. The length of the needle can be varied as desired. Long, carefully insulated, thin needles are used in treating bladder tumors through a metal, or, preferably, a hard rubber, open-air Kelly cystoscope. A tonsil snare is very handy in removing papillomatous growths of the bladder through a suprapubic incision, or similar tumors of the rectum through a proctoscope. The snare is thrown around the pedicle and the current run down it by contact of its metal handle to the active electrode. As the snare is drawn through the pedicle, the current coagulates the tissue. The tumor then drops off, leaving a white, dry, coagulated surface.

In treating accessible malignancy by electrothermic methods it is always advisable to *circumvallate* the growth with a line of coagulation. This is done by inserting the needle in the healthy tissue just outside the disease. After the current has caused a white zone of coagulation around the needle, the latter is moved to an adjacent area, and so on until blood and lymph drainage, from the affected part, has been cut off. Wherever possible, especially in the tongue, the needle should be inserted beneath the tumor so as to cut off the circulation from below. When complete hemostasis of the tumor has been obtained, it takes on a purplish color. One may then safely remove tissue for diagnosis after which the entire disease is coagulated and removed as a mass of dead tissue. The removal can be accomplished by scissors, scalpel, curet, or acusector. I prefer the latter as it does not require exchange of instruments, and consequent delay in time. Frequently a wire loop may be used in place of a straight needle. With this loop carrying the acusection current, one can quickly curet away the dead tissue. After reaching the extent of the coagulated area, one can repeat the process as many times as necessary to remove all the growth being sure to leave a dry surface.

Fig. 2. Basal cell epithelioma of nose after desiccation: The cancer cells are shriveled and elongated, but retain their nuclei and cell walls.

Some surgeons prefer to leave the coagulated tissue to come away as a secondary

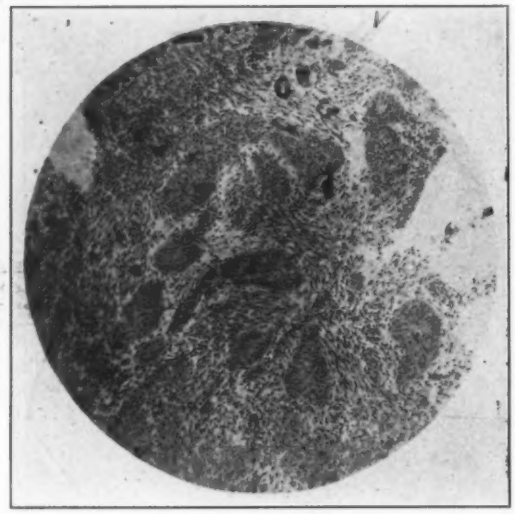

Fig. 3—Squamous cell carcinoma of face before treatment.

slough. This gives a great risk of infection, and I therefore prefer to remove as much slough as possible at the operation. The wound is then dressed with an antiseptic ointment or hypochlorite solution, and treated as a septic one until healthy granulations have developed, when skin grafting may be done.

Repeated attempts to manufacture a needle to which coagulated tissues will not adhere, have thus far been futile, and the needles continue to become gummed with the destroyed growth, requiring frequent cleaning. Ordinary gauze and cotton sponges are much too soft to wipe the needle clean. Formerly, I used steel wool in the form of small sponges. This sufficed quickly to clean the needle but small fragments broke off into the wound, especially dangerous in abdominal and breast operations. I now satisfactorily employ a steel sponge of the type used in cleaning kitchen utensils. These sponges are made by weaving strong steel threads, with sharp cutting edges, in such a manner that pieces will not break off into the operative field.

HEMOSTASIS.

Hemostasis is a constant problem in any operative work and any new and quick method for permanent control of bleeding is always acceptable. In the Med. Jr. and Rec. for April 15, 1925, I published a new method for hemostasis without suture. The technic is simple, time saving, and readily applicable in abdominal incisions, breast amputations, and in removng surface growths. The large vessels not sealed with the acusector are caught with the usual hemostatic clamps. At a suitable time during the operation when permanent hemostasis is desired, one by one the clamps are grasped with the operator's left hand and touched with the active electrode held in his right and carrying a fairly strong coagulating (damped) current. The contact is maintained until a thin zone of white coagulation appears around the tip of the clamp, when the current is cut off and the clamp released. Complete hemostasis results. This method has three distinct advantages: (1) Great saving of time, taking about one-third as long as to tie it and cut the ligature. (2) Less foreign material is left in the wound than when using ligatures. The amount of coagulated tissue around the vessel is easily absorbed. (3) Marked saving in ligature material.

VARIATION OF ACUSECTOR CURRENT TO SUIT THE TYPE OF TISSUE BEING CUT.

A great asset to the use of the Endotherm knife (Acusector) is the flexibility of the current employed. The variation of current is accomplished by any one of three ways or a combination of any two or all three of them: (1) Reduction in the current running through the filaments of the three electrode vacuum tubes, which lowers the temperature of the tubes and cuts down the current flowing through their grid circuits with a corresponding decrease in the current flowing through the acusector. (2) If the grid circuit and transformer circuit are thrown out of tune by adjusting the variocoupler, an effect similar to (1) is obtained. (3) By changing the rheostat resistance in the main acusector current, the cutting current may be easily decreased or increased.

These alterations in current permit of any range of operation from the powerful ones quickly cutting through deep layers of fat as in opening the abdomen or amputating the malignant breast to smaller currents used in performing pan-hysterectomies, intestinal anastamoses, opening gall bladders, or delicately dissecting between adjacent loops of bowel without injury to the intestinal wall.

ANAESTHESIA.

In large tumors a general anaesthetic, such as gas or ether, is preferable. If ether is used it must be removed from the room before the current is turned on, particularly when operated about the head and neck. If this precaution is observed carefully there is no danger of explosion. The hypodermic administration of scopomalin, 1/150 of a grain, morphine, 1/4 of a grain, and atropin, 1/150 of a grain, prior to anaesthesia, greatly lessens the amount of anaesthetic necessary. Some patients may be narcotized by a little heavier dose of these drugs, or they may be given prior to the use of local anaethesia, with great assistance. Small epitheliomas and benign growths can be efficiently treated under 1 or 2% solution of procain. In the oral cavity and tongue, the operation may be successfully performed after efficient nerve blocking.

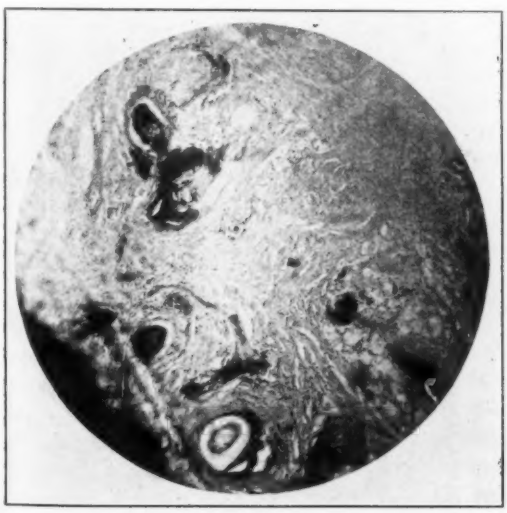

Fig. 4—Same area as in Fig. 3 after coagulation. The groups of epithelial cells have been converted into masses of homogeneous cell debris. The stroma cells appear as lifeless hyalinized tissue.

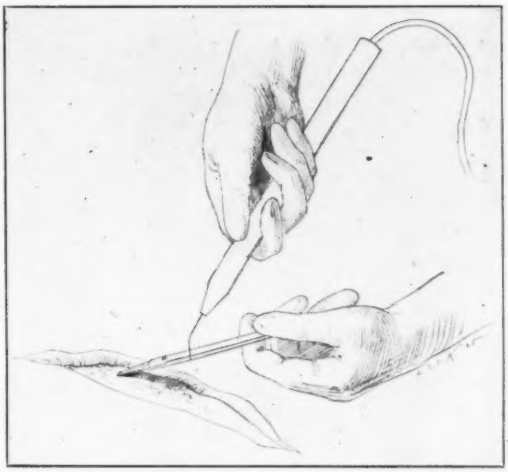

Fig. 5—Shows method of hemostasis without suture. The clamp grasping the vessel is held in one hand so that no portion of the clamp, except the tip, touches the patient. The active electrode carrying the coagulation current is then applied to the clamp and allowed to remain until there is a line of coagulation to the tip of the clamp.

THE CAUTERY VS. ELECTROTHERMIC METHODS.

As has been repeatedly pointed out by Clark and others, the extensive charring, or carbonization, caused by the cautery, actually forms a barrier to the further penetration of the heat applied. With desiccation and coagulation there should be no carbonization unless there is free bleeding. The tissues are converted into a white coagulum from which the water boils out. As stated above, the heat is not applied from without as with the cautery, but is generated within the tissues by the passage of high frequency current. We can easily see then how much more pentrating is the effect of electrothermic method as compared with the actual "hot" cautery. The active electrode of the former is cold, all the heat arising in the tissues.

ELECTROTHERMIC METHODS AND RADIATION.

At the Howard A. Kelly Hospital radium has been used with great success in the treatment of all types of accessible malignancy. Following heavy irradiation, par-

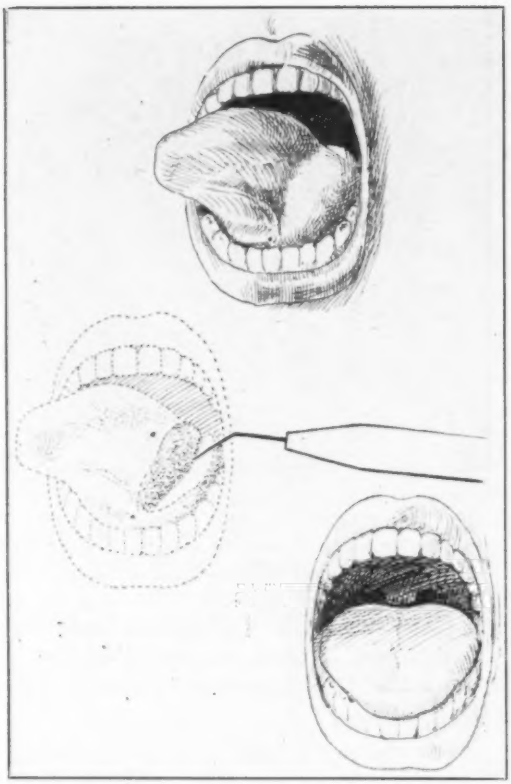

Fig. 6—Illustrates a Ranula which was inserted under local anaesthesia and the epithelial lining desiccated. Middle picture). The end result was perfect.

ticularly when several treatments have been applied over a considerable period of time, a slowly healing, indolent, painful ulceration results. This is particularly true in in the oral cavity where infection abounds. In a series of cases, I have combined heavy irradiation with electrothermic removal. In these the heat produced tends to counteract the formation of dense hyalinized scar tissue, and stimulates development of healthy granulation. This markedly reduces the post-radiation pain and permits of early plastic operation.

It is a little difficult to say whether a given case should be radiated before or after operation, but the writer's experience seems to indicate that the radiation should be done first. This may be accomplished by direct application of radium or the implantation of emanation seeds or radium needles. If direct application is used with careful protection of the surrounding normal structures, one is able to give a much larger dose than ordinarily without slowly healing painful scars because of the electrothermic operation which is performed a few days after the radiation. The combination of these 2 methods of physical therapy, gives the patient a dual chance of cure. Heavy external radiation, with radium or deep therapy X-ray, over the gland areas draining the affected part, adds to the likelihood of cure.

CLINICAL STUDIES.

Benign minor lesions of the skin, as keratoses, moles, warts, corns, callosities, and small epitheliomas, yield readily to electrodesiccation. The strength of the current should, of course, vary with the size of the growth, but usually, with the smaller lesions, it is quite mild, whereas the larger ones require a heavier voltage and amperage. A good criterion of sufficient treatment is to leave the needle in the lesion until the spark resembling a flame has

Fig. 7—Epithelioma, which had eroded the bridge of the nose and involved the inner canthus of right eye, before treatment.

penetrated throughout it, thus literally lighting up the tissue, and continue the application until the entire growth becomes whitened. In larger benign tumors the needle is moved from place to place until the diseased area is thoroughly treated. One must constantly guard against over-treatment as destruction goes well beyond the area of visible change. This is particularly true in the larger malignant growths in which electro-coagulation is essential. In from 5 to 7 days, the small benign lesions dry up and come away; with the larger ones and small epitheliomas (1.5 cm. in diameter or less), from 1 to 3 weeks is required for complete healing. In this group of cases the percentage of cures with one treatment is very high. Occasionally a second is indicated.

In treating epitheliomas larger than 1.5 cm. in diameter, electro-coagulation is essential. It is to be relied on alone in a number of cases, but in the more advanced the best results are obtained when it is combined with one form of radiation therapy, as noted above. In patients in whom gland metastases have already developed, this is obviously imperative. Here, as in small epitheliomas and benign tumors, the active electrode can be an ordinary needle, although in some situations a specially shaped one is used, particularly when working in a cavity such as the mouth, throat, bladder, vagina and rectum. Whenever possible, the technic of circumvallation as described above, should be followed.

Occasionally, inflammation follows endothermy and varies proportionally to the amount of irritation to the surrounding skin and secondary infection. It is to be remembered, of course, that with the high frequency current, producing heat sufficient to coagulate tissue proteins, sterilization is accomplished. However, with a sloughing wound, secondary infection is a complication to be guarded against at all times. It is combatted as in the case of any other septic wound. In the mouth the problem

Fig. 8—The same as Fig. 7 ten months after radium and coagulation. Microscopical examination of tissue taken recently shows no growth. Prosthesis has been made to replace the defect. (Not illustrated.)

is a different one. Infection can not be avoided, pain sometimes occurs as a result, and secondary hemorrhage from the sloughing of a large vessel wall is occasionally seen. This is guarded against by the topical application of hypochlorite solution 2 or 3 times a day, which keeps the slough firm. If the wounds of the skin are kept aseptic, there is very little pain.

I carried out an interesting experiment a few weeks ago at a breast operation. The primary lesion was a large sloughing one. The skin around it was prepared by the usual ether-alcohol and iodine technic, and the ulcerated area covered with a thin layer of collodion. The patient was then draped for the operation. Before making the incision, the entire area covered by the collodion was thoroughly coagulated to a depth of a centimeter. Cultures had been taken previous to the application of the collodion, and after the operation a piece of the coagulated tumor was cultured. It was sterile as compared with an abundant

Fig. 9—Squamous cell carcinoma of right temple before treatment. Patient feeble man, 78 years of age.

growth in the pre-operative culture. This patient had a slight amount of post-operative infection in the upper part of the wound which was probably due to organisms in the skin which were not sterilized by the chemical technic. (The skin surrounding the ulcer had been contaminated for some time by the discharges from an open lesion.)

Removal of malignant growths of the tongue and mouth by electro-coagulation can be readily accomplished under local anaesthesia, or nerve block. These operations, however, should be preceded by preliminary ligations of the lingual artery in the neck to prevent post operative hemorrhage. Electro-thermic methods are especially valuable in treatment of lesions of the oral cavity for 2 reasons: (1), the scar is soft and pliable so that large portions of the tongue can be removed with little interference in articulation; (2) there is much less pain post-operatively than after the use of strong doses of radium. As already mentioned, a combination of electro-thermic methods and radiation also gives a much better scar and much less pain than after heavy radiation alone.

In the treatment of large basal cell and squamous cell carcinomas of the skin, electro-thermic operations should be preceded by heavy radiation, either by the direct application of radon tubes or by the distance method. In 2 or 3 days, after treatment, or, if desired, on the same day, the whole area can be removed with electro-coagulation. The slough comes away in a week or ten days, and healthy granulation develop with little scar tissue so that plastic operations can usually be done in from 2 to 4 weeks after the operation. However, if cartilage or bone has been removed, and reconstructive operations have to be done, as in removals of portions of the nose, a longer lapse of time should be allowed to assure against recurrence.

A very interesting case illustrating several points which I have mentioned is that of a man who came with a squamous epithelioma on his right temple. I first gave him twice the erythema dose of radium at a distance of one inch, over 2 areas which took in the entire wound. The next day, under scopolamin-morphine narcosis and local anaesthesia, I removed the growth with electro-coagulation. The sloughing which occurred exposed a small area of bone. After the slough had cleared away, healthy looking granulations sprang up. Before skin grafting, tissue was taken for microscopical examination which showed islands of tumor cells, some showing the effect of the radiation. In view of the patient's age and general debility, it was deemed advisable to cover the wound with pinch grafts taken from the thigh, and if there was a recurrence to treat with radium rather than further operation. This procedure was carried out and the patient went home in fairly good general condition. Several months have now elapsed and there is no sign of recurrence. This illustrates two points: (1), the value of combining

radiation and electro-thermic methods, and, (2), the fact brought out by Horsley that skin, taken from a distant point and grafted over an area of growth, inhibits the development of or actually destroys cancer cells.

ELECTRO-THERMIC METHODS IN GENERAL SURGERY.

At the Kelly Hospital we have employed the acusector to replace the scalpel in many kinds of operations. The value of the acusector to the general surgeon is still undetermined. Before any conclusion can be drawn, a statistical study of a considerable series of cases must be made. We have performed more than 50 breast operations including removing circumscribed nodules and simple and radical amputations. The type of operation is unessential, the surgeon choosing his usual method of incision and dissection. There is a definite decrease in the capillary oozing and a searing of the lymphatics. The larger vessels are clamped in the usual manner. Great care must be taken in dissecting the axilla, not to injure the axillary vessels. To prevent this a wooden spatula is placed against the vessel. A preferable technic, however, is to employ the Kelly comb to skeletonize the branches of the main vessels, and then doubly clamp them and cut with scissors. The entire operation, including the axillary dissection, has been done with the acusector, and without the use of a single ligature. This case healed per primum with no secondary complications. As a rule, however, it is better to ligate the branches of the axillary vessels, although a great deal of time and ligature material can be saved by coagulating all of the other vessels which have been caught by the usual hemostat. These are then coagulated by the method of hemostasis described above.

Practically all of the various types of pelvic operations have been performed with the acusector. Pan-hysterectomies, myomectomies, salpingo-oophorectomies, and bladder resections can be done with distinctly less capillary bleeding. Of course,

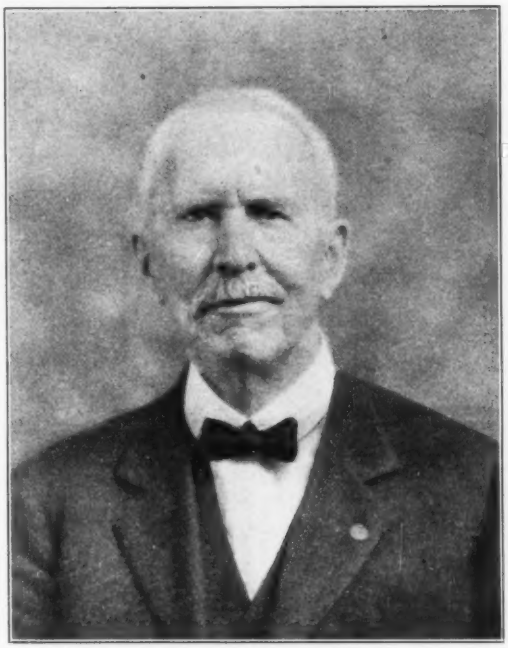

Fig. 10—Same as Fig. 9 six months after treatment which consisted of heavy radiation, removal by coagulation under local anaesthesia and Riverden pinch graft from right thigh. Photo sent by patient.

all of the large vessels are clamped and ligated or transfixed as usual. The advantage over the scalpel is that much more delicate dissection can be done by the use of a very fine cutting current; the acusector obscuring the line of cleavage much less than the wider scalpel. In the resection and anatamosis of the stomach and intestines, the acusector greatly facilitates the operation by stopping much of the capillary oozing. In all of these operations and particularly in the breast work, there is much less handling and traumatism of the tissues. As Dr. Kelly has aptly put it, one actually does a knife and fork operation. This reduces materially the amount of mutilation of tissues with consequent infection.

In a recent communication, I published a new technic for the treatment of ranula which has opened a large field of work. Under local anaesthesia, I incised the cyst with the acusector and then desiccated its epithelial lining. In a short time the thin layer of desiccated tissue came away and

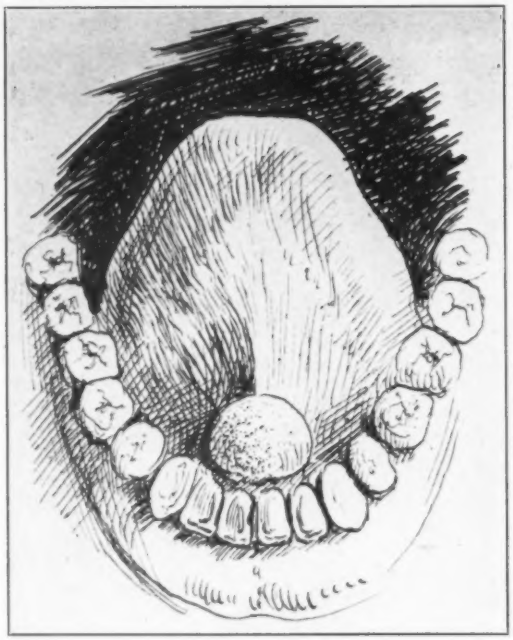

Fig. 11—Epithelioma floor of mouth before treatment.

the lesion healed with very little scar. By this method the usual long and bloody resection of the cyst with the dangers of a general anaesthetic and prolonged hospitalization were avoided. This immediately suggested the employment of electro-desiccation in the treatment of larger epithelial lined cavities, such as post-operative hernias and smaller ovarian cysts. In the latter instance, practically all the ovarian tissue can be saved.

The value of this technic in greatly facilitating the operation for post-operative hernia, is readily illustrated by the following case. After opening the abdomen of a woman who had a very extensive post-operative ventral hernia, the abdominal side of the hernial sac was insized all the way around the opening and the edges of the parietal peritoneum approximated with plain catgut. This shut off the hernial sac from the abdomen. In place of a long, bloody resection of the adherent sac wall, its epithelial lining was thoroughly desiccated. The rest of the abdominal incision was then closed in the usual manner of carefully approximating each layer of muscle and fascia, thereby obliterating the hernial sac. The thin layer of desiccated epithelium was readily absorbed without infection, the entire wound healing per primum. The scalpel was not employed throughout the operation.

SUMMARY.

1. Electro-thermic methods are of inestimable value in treating benign and small malignant lesions of the skin, partcularly with the benign moles and fibroma-molluscum which do not yield to radium. Black pigmented moles, which easily become malignant, but which are unaffected by radiation, can be completely removed by adequate desiccation or coagulation.

2. Electro-thermic methods are very efficient in removing large, accessible malignancy, and bladder, cervical or rectal polyps.

3. Electro-coagulation is a great adjunct to the radiologist in the treatment of accessible malignancy, especially in preventing slowly-healing, painful, sclerotic ulceration after heavy radiation.

4. The absolute value of electro-thermic methods, especially the acusector, in general surgery, is still undetermined. Acusection is of great aid in performing breast operations, opening the abdomen, and doing various pelvic and abdominal operations, particularly intestinal resection and anastomosis. Hemostasis by the clamp coagulation method as herein described, is a great adjunct to the general surgeon in reducing the time of tying off many blood vessels and is an economical asset in the saving of ligature material.

DISCUSSION.

Dr. S. C. Barrow (Shreveport): Mr. Chairman and Gentlemen: I was just wondering what could be said in the way of discussion. The doctor has covered things so thoroughly in every detail that there is nothing left to be said. The terms used, to those men not doing the particular work that he is doing, sometimes are a little confusing and leave the impression that there is

quite an elaborate method to be used, etc. Dessication, coagulation, fulguration, carbonization scientifically and theoretically differ but for all practical purposes it is the same thing, one being only a degree more than the other.

I made the statement a little while ago that we were not treating our mucous membrane as well as our lip cases by means of radiation, and I am not at this time though I didn't mean to say that I questioned Dr. Grier's result on those cases. We have done it in the past but our failures in lip cases and mucous membrane cases were so constant and our results, good ones, so few that we have switched entirely and are using the coagulation method. I just have two cases to illustrate the ones that we have.

I am my own photographer so no apologies are due for my photography. (Showed slides.) This old gentleman lives near Shreveport. About a year ago he came in with that heavy lip infiltration extending from beyond the median line way back and into the mouth, and with a deep epithelioma at the inner canthus, one on his nose and about twelve over the face. He is nearly eighty years old.

I do all my fulguration coagulation in the office under gas anesthesia. This man was so old that I feared to do it. I thought something might happen. So we carried him to the hospital and in fifteen minutes this whole mass was coagulated back fully two-thirds to the angle of the jaw, deep down into the inner canthus, this one (illustrating) and numerous other ones which you can't see.

He immediately went out of the hospital, that is, after a few hours. I was afraid of secondary hemorrhage but the doctor was with him and he carried him home. I am awfully sorry this doesn't show as it should, but in eight weeks he returned to the office and this had perfectly healed. When this first necrotic area fell out, he couldn't hold water in his mouth unless his head was sidewise. This completely healed, closed in, so that the puckering was not noticeable across the room. This one (illustrating) had healed entirely. Of course that case, gentlemen, was heavily x-rayed over the lymphatics in that area.

Now here (next slide) is the type of case that we most generally see. This was a young man comparatively speaking and he looked cachectic to the last degree. He was sallow and muddy and sick. He had been absorbing a great amount of sloughing tissue debris and matter from this place and that was done in the office under gas anesthesia. He was thoroughly fulgurated, his

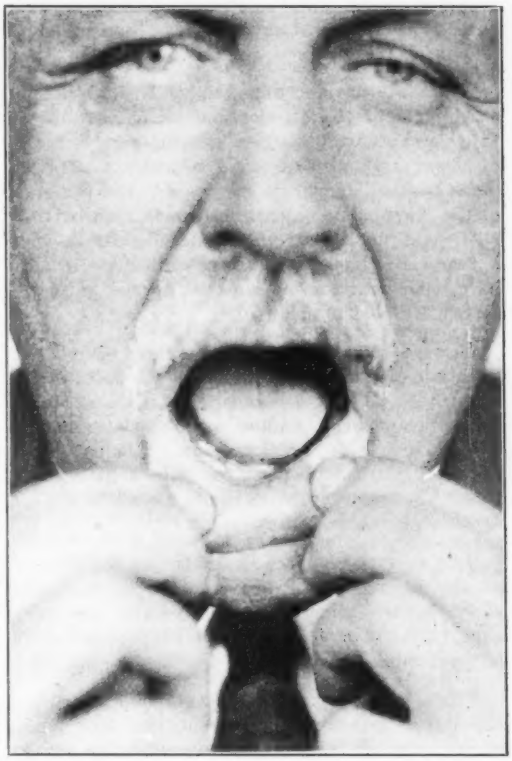

Fig. 12—Same as Fig. 11 after treatment which consisted of implantation of radium emanation, followed in five days by removal with electro-coagulation. The inferior dental nerves were blocked and adjacent teeth removed. Patient has remained well a year and a half.

neck was x-radiated, and in eight weeks he was completely well. This case is over a year old. The other one was not quite so old. He has no glandular enlargement yet and a soft scar there which really looks on him better than it does on the picture.

We feel that those cases can be handled by x-rays, radium and fulguration, but in mucous membrane cases we feel as if we have a better chance now by the electro-coagulation.

Dr. H. W. E. Walther (New Orleans): I have enjoyed Dr. Ward's paper very much. I think his missionary visit to us will bear fruit. We always prick up our ears, I think, when visitors come to us.

I haven't been able to impress my brethren in Louisiana very much with electro-coagulation and its value in medicine. In Chicago, in June, 1924, it fell to my lot and my pleasure to present before the American Medical Association the first paper on diathermy as applied to urological conditions. I stated at that time, and I feel today, that surgical diathermy has proven itself

superior to all other methods of dealing with vesicle neoplasms, tumors of the urethra and lesions of the external genitals.

Up to the present time I have treated sixteen carcinomas of the bladder and six carcinomas of the urethra with surgical diathermy with an operative mortality of five. I have not used radium in the bladder in two years and Bumpus of the Mayo clinic recently informed me that they have used no radium in bladder cancer in over a year. His experience tallies with mine in that he considers diathermy superior to the knife resection of bladder growth.

A word of warning in regard to technic. I believe men taking up this work, as pointed out by Dr. Ward, in their experiments, should practice on raw meat, finding out the penetrability of the current of their machine. The technic is exacting but can be mastered with a little practice. The field should be well exposed and kept dry during the procedure.

Our work is not so spectacular as doing work on the surface of the body and we can't always show lantern slides, but the results are very encouraging and are very gratefully received by our patients.

There is danger in using a bipolar spark on the upper extremities or about the face when giving an ether anesthetic. An electric fan should be blowing the fumes away from the machine and the applicator if you are using unipolar current. We usually on the surface use what we call fulguration, which is spraying the tumor with electric sparks; whereas by using bipolar current, we are using real diathermy or heat deeply by putting the electrode into the growth, sinking it into the mass with no sparking whatever. I think it is a mistake for us to continually mix up these two terms, fulguration and diathermy. It is claimed we are adding unnecessary words to our nomenclature. We are not. Fulguration is spraying a tumor with a spark or series of sparks while diathermy is heating the tissues to a high degree by putting the electrode in the growth with no spray, and, as the doctor pointed out, with no charring of tissue.

Dr. R. H. Foster (Pineville): I appreciated the paper on this topic very much. There are just a few interesting features that I desire to mention. One is the use of diathermy about the soft tissues, about the prepuce and the glans penis. If you intend to employ this method, I want every one to go away from here and remember that there is such a thing as a dark field examination in all appropriate cases. Don't ever coagulate or desiccate a venereal ulcer without making the appropriate examination for spirochaete, and when you want to destroy warts don't forget there will be edema if you use coagulation.

Results in intravesical papilloma have been satisfactory in the few cases I have seen. A few months back I had a gentleman with a papilloma near one urethral orifice about the size of the tip of my little finger, which I attempted to coagulate with the use of diathermy. I had to get the spark anyway but I tried to do the diathermy strictly. I destroyed the growth and he insisted on going to Houston two days later as he was a traveling man and had his program. He went over and reported back in a month or two. There was a mass that I had overlooked which I destroyed, since which time there has been no bleeding and no mass visible.

After the method of Bud Corbis, I attempted the coagulation of the mass of malignant prostate with bipolar diathermy, with the result that the patient was made comfortable and got rosy cheeks and took on weight and everything looked fine for about three months. Then things went bad again and we had a funeral.

There is just one other little matter. In cases of granular cervicitis with obstinate leukorrhea, I have been able to clean up the cervix and get a nice looking result with the clearing of the discharge in more cases than I have been able to do by other method. This is by dessication rather than by bipolar method.

Dr. A. J. Thomas (Shreveport): I have enjoyed Dr. Wards' paper very much, also the discussions, especially Dr. Barrows.' I have seen Dr. Barrow do considerable of this work, he uses standardized technic. There are just a few points that I might add to the discussion. In using this method in orificial work, where the lesion affects the mucous membranes, especially the papilomatous neoplasms, I think the best results can be obtained by using the indirect Tesla technic for the reason you have absolute control over your current without the use of any foot switch. The electric current is carried to patient's body through the autocondensation pad or by means of a block tin electrode in direct contact with the skin. The diseased area in the bladder is visualized with the cystoscope, in the throat a tongue retractor is used, an aluminum probe with its distal end tapering to a needle point, held with the operator's thumb and index fingers is your active or destructive electrode, is applied to the growth and kept in near or direct contact until the tissues are blanched, you ground this current as long as this contact is maintained, drawing the current out of the patient's body through the area you desire to destroy. In case deeper

destruction is required, greater volume and higher frequencies are obtained by proper adjustment of the rheostat and spark gap controls which are the business end of a high frequency machine, with correct manipulation you get greater tissue penetration and destruction. Some of the terms are confusing to those of you without experience in this line of work. Fulguration is a uni-polar current essentially a bombardment of the growth with a shower of sparks. Electrocoagulation is a bi-polar current, the needle or active electrode is introduced or buried in the growth and current applied. Surface lesions about muco-cutaneous junctions that have resisted radium or x-ray radiations I think are being cured by this method, at least I have had some very favorable results. Drs. Clark and Pfahler of Philadelphia and Dr. Plank of Chicago have originated special technic and obtained many cures. I think the surgeons as a whole don't appreciate this line of work, they still cling to the cautery method which produces only superficial heat and carbonization of tissue, carbon being a good non-conductor prevents any electric energy penetration beneath carbonized zone, whereas with Dr. Ward's or other surgical diathermy technic with an efficient high frequency apparatus correctly controlled and applied you can administer a lethal dose of heat to malignant cells at any depth or area desired with good end results, if the growth is accessible, or provision has been made for adequate surgical drainage.

Dr. Ward (in closing): I want to thank Dr. McKinney and the Society for the privilege of being with you these two days, and thank those who have been kind enough to discuss my paper. There are a few points emphasized in the discussion to which I wish to call attention.

Dr. Barrow spoke of eliminating radium and x-ray from cases of malignancy of the mucous membranes. I do not feel that that is justifiable. In treating malignancy of the tongue and floor of the mouth and tonsil, radium cannot be eliminated; in fact, it is an excellent form of treatment. However, by combining it with coagulation or desiccation the cosmetic result is much better, the scar is softer, the pain is decreased and the period of healing and convalescence shortened.

The last carcinoma of the floor of the mouth which I treated had a tiny recurrence after coagulation without previous radiation. This recurrence was in a distant point which was insufficiently treated. I have had other similar experiences and feel that the combination treatment in the mouth is the treatment which ought to be followed.

Dr. Walther mentioned malignant tumors of the bladder. We have had such splendid results with radium alone that only in a few cases have we used electrothermic methods. We have had good results with our bladder tumors without bladder irritation if the dosage and the screening have been proper. However, there is a very splendid electro-surgical technique, applicable for papillomas of the bladder or rectum, which I will describe briefly. We removed twelve or more from the rectum in one case with a tonsil snare in the following manner:

The tonsil snare was placed about the pedicle of the papilloma and connected with the active electrode. While drawing the snare through the pedicle the current coagulated the tissue allowing the tumor to drop off without bleeding. This method was first worked out and described by Wm. L. Clark.

For anesthesia, while operating about the mouth, one may employ local injection, nerve block or ether, but in using ether the mask is removed from the room or at least a distance from the patient and there is no danger of explosion. Thank you.

PROSTATECTOMY UNDER LOCAL ANESTHESIA.*

CARROLL W. ALLEN, M. D.,

NEW ORLEANS.

There has in recent years been an increasing tendency to lessen the preparatory treatment of surgical cases and this has been justified by the better results obtained in the majority of cases and is explained by the fact that the least disturbance to their usual routine of life the better will their condition be to withstand the surgical ordeal.

However in the operative relief of hypertrophy of the prostate we have in the great majority of cases to consider certain factors which are not involved in other surgical procedures. These factors are the age of the patient and the relation between the bladder and kidney function. In the old and feeble prostatectomy is a formidable procedure, though not attended by a greater mortality than that following any

*Read before the Mississippi State Medical Association, Jackson, May 11-13, 1926.

other major operation in the same class of patients and may even show a more favorable comparison by taking certain precautions in the handling of these cases.

The two stage operation is at the present time generally conceded by the majority of surgeons to be the safest plan but many do not fully appreciate the reasons for this procedure as shown by their too hastily undertaking the second stage before the patient has fully recovered his physical equilibrium and the kidneys resumed their normal function.

The two great factors in the production of shock are trauma and hemorrhage and to these in the great majority of cases can be added that of the general anesthetic. In the use of the more improved general anesthetics this may be practically eliminated as a shock producing factor, yet nevertheless has its dangers in certain cases and must be reckoned with. While shock is not entirely eliminated by the use of local anesthesia it is greatly lessened and hemorrhage can be practically entirely eliminated, or at least reduced to a negligible quantity, by the use of adrenalin in the anesthetic solution when injected peripherally around the prostate, inside its capsule, which method I almost invariably use except in cases suspected of malignancy when a sacral injection should be the method of choice.

Few patients requiring prostatectomy present themselves for operation before they have seriously felt the inconvenience of this condition, many have probably already been initiated into catheter life, some have had one or more attacks of acute retention of urine from prostatic congestion, and practically all will show renal complications; nearly all are disturbed frequently at night by having to arise to urinate. The kidneys have gradually accustomed themselves to this condition and are working against considerable back pressure, and the sudden relief of this pressure at operation completely upsets the renal equilibrium leading to congestion with diminished excretion, probably anuria. Here lies the particular danger in these cases, and to avoid it we must first relieve the bladder and permit the kidneys to recover by performing these operations in at least two stages in all cases that show much residual urine or are suffering from retention at the time of operation. The danger, too, of suddenly relieving a distended bladder cannot be overestimated; vesical hemorrhage may occur associated with renal suppression. In my observation, this procedure alone has caused as great a mortality as prostatectomy.

In extreme cases such bladders should never be opened at once, unless badly infected and the danger of general infection too great for delay. They should be gradually evacuated by catheter, removing but a portion of the urine at a time at two- or three-hour intervals, or if almost completely emptied one-fourth to one-third as much boric acid solution reinjected as there was urine removed. This gradual emptying process should consume from twenty-four to forty-eight hours before the bladder is opened.

Rarely a case is met with in which there is considerable distention and the passage of a catheter too painful, difficult, or even impossible of accomplishment. In such cases, if the suprapubic incision is carried down to the bladder, the bladder can then be emptied by a gradual process of aspiration at intervals of several hours, withdrawing more and more at each successive aspiration, thus overcoming the difficulty. During these intervals the suprapubic wound is kept packed. After twenty-four or forty-eight hours the bladder, which is now fairly collapsed, can be opened with safety.

The method of performing the cystotomy and of dealing with the bladder afterwards is of some consequence. It may be opened with a free incision with the introduction of a tube or catheter to its base and the attachment of some syphoning apparatus,

or the escape of urine may be effectively controlled by making a small buttonhole opening into which is passed a Pesser catheter. The incision is then infolded and held by two stitches, one placed on either side of the catheter. Such a valvelike closure will leak very little, if at all.

Badly infected bladders after being freely exposed and sutured to the rectal sheath can be opened by a cautery thus reducing all raw surfaces to a minimum.

The advantage of some method which permits the collection of all urine is quite important as in this way the functional activity of the kidneys can be accurately gauged. It will usually be found that the urinary excretion for the first two days diminishes considerably following the cystotomy, gradually increasing from the third to the fifth day, and is about normal by the end of the first week. By this time, if the patient's general condition is good as shown by normal appetite with good digestion, free bowel movements and after a few nights' normal restful sleep, free from the annoyance of frequent urinations, the removal of the prostate can be undertaken.

If any question exists regarding the condition of the kidneys a further delay is necessary, or their capacity may be tested by phenolsulphonepthalein, and under no condition should the prostatectomy be attempted until they have reached a fairly normal condition of elimination.

In determining this last point of normal kidney function we cannot adopt the usually accepted standard of the healthy person but have to accept what is normal for the individual as determined by a return to their pre-operative physical condition as shown by a constant urinary output, easily functioning digestive organs and refreshing undisturbed rest at nights.

Some cases are extremely slow and tardy in recovering their pre-operative status and I have always felt I was well repaid by allowing them ample time for a full recovery.

In one case in a patient 84 years of age he went home where he was so comfortable he remained for one year and returned in excellent condition making an easy recovery from the second stage. I feel that any attempt to operate him shortly following the cystotomy would have been fatal.

By handling patients in this way many bad risks and feeble individuals may be safely carried through the surgical ordeal.

During the interval between the suprapubic cystotomy and the prostatectomy the bladder should be washed once or more daily with warm boracic acid solution and the suprapubic wound kept lightly packed, and any infection in the cellular planes which may have occurred, which, however, is rare, should be well under control before the final operation is attempted.

It is usually noticed that the prostate diminishes decidedly in size following the cystotomy due to the relief of the congestion and this diminution in size facilitates its later removal.

For the suprapubic cystotomy the bladder is first irrigated freely through a catheter with boracic acid solution and left moderately distended.

It would seem unnecessary to discuss the technic of anesthetizing the abdominal wall for the cystotomy except to state that it is accomplished by a progressive method of infiltration from the skin downward and as much of it as possible is done before the incision is made. The deeper parts beneath the recti-muscles are anesthetized as they are approached.

Before the bladder is opened it is desirable to fix it to the posterior rectal sheath to prevent the possible soiling and infection of prevesical tissues below or the pro-peritoneal tissues above. In cases where the bladder is small and retracted the peritoneum may be opened in searching

for it. Should this occur no bad results need be anticipated if it is immediately closed and the opening of the bladder need not be deferred for this reason. After the bladder is securely anchored to the posterior rectal sheath, a stab wound is made in its most prominent part and a suction nosel slipped in as the scalpel is withdrawn and its contents evacuated without soiling the wound.

The superior bladder-wall is not, as a rule, very sensitive but it should be lightly infiltrated before being incised. The bladder is then freely irrigated by passing an irrigating nozzle down alongside the suction. Following this its cavity may then be explored determining the size of the intravesical projection of the prostate, removing calculi should they exist, and obtaining any other information which may be necessary. If a direct visual inspection is desired in cases in which complications are suspected, this can be easily accomplished by evacuating the contents of the bladder and by placing the patient in the Trendelenburg position air will enter and dilate the bladder and its interior can thus be freely inspected by gently retracting the incision.

If such intravesical examination is necessary or it is desirable to examine the vesical cavity digitally, some form of intravesical anaesthesia then becomes necessary.

The particular sensation with which the bladder is endowed and which is felt upon any abnormal contact with its walls, either internally or externally, is that feeling which we term the desire to urinate. This feeling is more easily excited by manipulation from within and always more acutely toward the vesical neck and prostate region. Pain is only complained of when these manipulations have been rough or when actual trauma has been inflicted. The introduction of a finger within the bladder for purposes of exploration excites a desire to urinate and this desire may become particularly urgent and always becomes so when the parts near the vesical neck are touched. It is not a pain but still may be quite unbearable and demands some effective methods to control it. This is accomplished in but a few moments of time. With the patient in the Trendelenburg position to dilate the cavity and bring its base into plain view, the anaesthetic solution is injected with a long, fine needle at four or five points around the vesical neck, injecting about one-half dram at each point. The needle is advanced just through the mucous membrane with a quick thrust, injecting the solution as the needle is advanced. Unlike the skin and most other tissues the bladder is tardy in recording its sensations and anaesthesia results before any sensation is felt. Ordinarily, these injections around the vesical neck are sufficient for all intravesical manipulations, which can now be undertaken with the greatest freedom. However, in complicating conditions where the lateral walls are to be operated upon, further infiltration around the field becomes necessary. But as most nerves reach the bladder near its base and around the vesical neck, the injections made here are most effective in controlling its sensations.

If the case is one that does not come within the class requiring a two-stage operation but the patient is in fairly good physical condition with good kidneys and with but little residual urine and no bladder infection, the prostate may be anaesthetized and removed at once, though I rarely ever perform the one-stage operation.

Whether this be done in a one- or two-stage operation, certain preparatory measures are advisable. One hour before operation a suppository containing 10 gr. of anaesthesin is placed in the rectum to anaesthetize this region and prevent any discomfort when the finger is introduced here in elevating the prostate; at the same time, one hour before operation, a hypodermic of morphin 1/6 gr. and scopolamin 1/150 gr. is administered to lessen psychical disturbances.

If the case is one in which a cystotomy has previously been done, the Pesser catheter or tube is removed from the suprapubic opening. The wound is found presenting a granular surface sloping down toward the vesical opening. This is most effectively and quickly anaesthetized by passing a fine needle through this granular surface and injecting just beyond. By beginning these injections above under the skin margin, the needle can be advanced obliquely in several directions creating a zone of anaesthesia just external to this wall of granulation tissue which will diffuse in all directions, blocking nerve-fibers which come into the field. This is done on both sides and carried down to the vesical opening. Injections are similarly made above and below the limits of the wound in the subcutaneous tissues in the median line, as the wound has probably contracted and will have to be enlarged. The passage of a fine needle through this granulation tissue causes no pain and for that reason is preferred to passing the needle from the skin down. A finger is passed into the bladder to outline its upper limits and determine the proximity of the peritoneal cavity above. Additional injections are now made into the upper wall of the bladder with the finger within guiding the point of the needle.

The bladder opening is enlarged and the patient placed in a moderate Trendelenburg position. After the bladder is well irrigated and emptied with the suction machine its walls are then retracted by long, deep, narrow retractors, bringing into view the field of the prostate.

In cases of simple benign hypertrophy I prefer the direct method of anaesthesia as described in this paper, but if malignancy is suspected or complications exist, sacral anaesthesia is preferred. My reason for preferring the direct method of anaesthesia is that it is easily and quickly carried out, gives immediate anaethesia and exerts a decided control upon the operative hemorrhage due to the adrenalin content of the anaesthetic solution. In cases of malignancy any injection around the prostate are obviously objectionable and all manipulations should be reduced to a minimum, resort is then had to the sacral method which also gives a wider area of anaesthesia which is often desirable.

With the bladder opened the needle is passed beneath the mucosa on the anterior bladder wall and progressively passed downward toward the prostate injecting as it is being advanced, when the prostate is reached the needle is passed to one side the solution flowing submucously over it. This gives us an anaesthetic pathway to the field of operation. The deep injections are begun at the vesical neck within this anaesthetic area and are made from this point backward on each side.

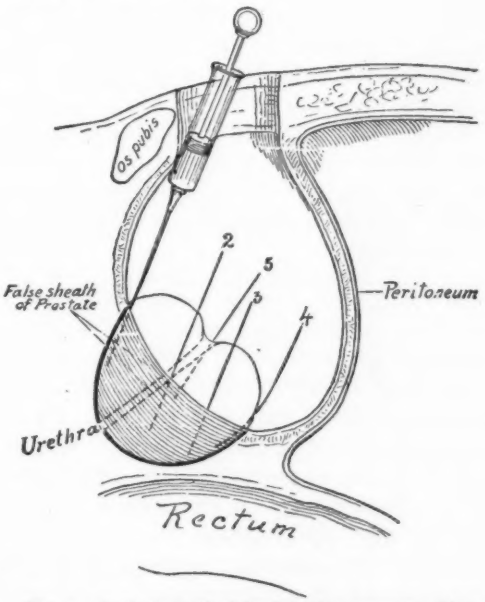

Fig. 1. Author's method for injecting prostate: Lines 1–3 indicate points for injection above and on side of prostate; 4, beneath prostate—this may at times be more conveniently made by a curved needle; 5, enters urethral opening, penetrates urethra, and is made between lobes of gland. While the lines show the axis of the injections with the prostate lying normally in its bed when the injections are made, the prostate is lifted up by a finger in the rectum, so that the needle can be more readily entered in the proper position through the suprapubic opening.

Depending upon the size and shape of the prostate, several points are selected for injection on the vesical surface, usually one below the opening of the urethra, near the base of the gland, and one on either side. The needle is passed through the mucosa, with the idea of making the injection between the true and false sheath of the prostate, as it is in this plane that the solution must diffuse around the gland, and it is in this plane that its enucleation is effected. It is here where the large venous plexuses are situated and where the nerve-filaments are more easily reached as they pass through to the prostate.

Five c.c. of a ½ percent novocaine solution, containing 10 minims of adrenalin to the ounce, are injected at each of the above points. The needle is then passed into the urethral opening and the lateral wall pierced first on one side and then on the other, and similar injections are made at these points. During these injections the finger is kept within the rectum to better guide the passage of the needle around the prostate where its point can be felt passing between the gland and its false capsule; it also facilitates these injections by elevating or manipulating the gland and guards against the penetration of the false capsule by the needle.

If the gland is very large, or there is much of a projection above the urethral opening, an additional injection can be made here. Otherwise the above will prove sufficient. It is well now to wait two or three minutes for the solution to diffuse and thorough anaesthesia to be established before beginning the enucleation. While waiting for the solution to diffuse, the action of the adrenalin is observed in the prostate, which becomes quite pale and bloodless.

In making the injections, should they be made into the substance of the gland itself no harm will be done, only they are not quite as effective as when injected peripherally between the true and false sheath; any excess of the solution thrown into the gland in this way is removed during its enucleation and not absorbed. Following these injections a catheter is passed into the bladder. The enucleation of the gland can now be undertaken by any method preferred by the operator and will be absolutely free from all pain or other discomfort. If the intra-urethral method is chosen the passage of the catheter can be omitted until later, but I have always found its presence a convenient guide to the location of the urethra during the different stages of the operation. A most striking feature is the absence of all bleeding, only a few sponges being slightly soiled, the loss of blood amounting to not more than a few drams at most and there is little blood to swab out of the bladder afterward.

The catheter which had been left in the urethra is now utilized to draw through the urethra, from the bladder outward, a stout piece of silk which has been doubled and passed through a plug or pad of iodoform gauze arranged somewhat cone-shape and about the size of the cavity left by the removed gland. The silk thread is long enough to reach beyond the glands penis and when pulled upon draws this plug effectively into the cavity thus insuring against any possible secondary hemorrhage. The plug in passing into the cavity also has the effect of turning in any free edge or shreds of mucous membrane against the raw surface of the capsule. One end of the pack is left long enough to protrude through the suprapubic opening to facilitate its removal later. This is a most effective and simple method of providing against possible secondary hemorrhage, which is impossible when the pack has been properly placed. As the pack is entirely under your control, it can be forced in tighter by drawing upon the urethral string, or loosened by manipulating the suprapubic end. This pack is usually moistened with compound tincture of benzoin, though occasionally mercurochrome is used.

Several ingeniously contrived bags have been devised for this purpose, but I prefer to use the pack.

A drainage tube placed in the suprapubic opening and a few approximating sutures complete the operation.

The pack is removed in twenty-four hours when danger of hemorrhage is past and the case is handled by the usual methods following these operations.

DISCUSSION.

Dr. E. H. Linfield (Gulfport): I do not intend to try to add anything to this splendid paper by my old professor of surgery and my chief when I was an interne, but I would like to say that in the preparation of your patient for a prostatectomy there are several things that can be done that will decrease the renal tension. Dr. Hugh Young has devised a method of releasing the pressure on the renal system. He puts a cather into the bladder and has a bottle with some antiseptic solution in it, oxycyanide of mercury 1 to 1000, and a tube running from the bottle down to a Y which connects with the catheter; on the other side of the Y this tube runs up to the level of the solution in the bottle, and then down into a waste bottle. This, as I understand it, can be lifted and lowered as desired. He fills the bottle with the solution and elevates it above the intravesicular pressure, which you can determine as the solution goes down into the bladder and then comes back out through this tube. When it begins to waste out into the bottle below you know you have reached the threshhold of the bladder vesicular pressure. In this way with this antiseptic solution you have constant irrigation of the bladder, you get away from infection, and every day you lower the tube a little until when your test is made you find the kidneys are functioning correctly. If you have your blood chemistry that is ideal.

I would like also to stress the doctor's remarks about keeping up with the blood pressure. You know with increase of renal tension you have increase of blood pressure, and these men with a large prostate, where there has been a retention of large residual urine, will show an increase in blood pressure, but as the renal tension diminishes the blood pressure comes down accordingly. Keeping up the creatinin and urea the blood comes down in proportion and after about the first week you get the blood pressure and blood chemistry and phthalein about on a level, and then you can do your prostatectomy without much danger.

Dr. M. Q. Ewing (Amory): I want to say a word in regard to local anaesthesia. If you do an operation under local anaesthesia it must be done carefully and it must be done right. Surgery under local anaesthesia must be done correctly. As to this particular operation of Dr. Allen, I have tried it, but without much success. I had to add gas-oxygen anaesthesia. I hope some time to see Dr. Allen do this operation and learn better how to do it, because I appreciate the value of being able to do the operation under local.

Dr. Carroll W. Allen (closing): I have not much to add except that I am enthusiastic about local anaesthesia. I started using it years ago when we had to work with cocaine. Novocaine, adrenalin and all these things have been luxuries to us. We also used chloroform for general anaesthetic. When I first went to Charity Hospital we never gave anything but chloroform as an anaesthetic, and I only saw ether given a few weeks before I left the institution. It was worth while developing local anaesthesia, and I still believe it is the best anaesthetic in prostatectomy on account of controlling the hemorrhage. There are some dangers and difficulties under local anaesthesia—but they are less than under general. With the use of local you can exercise a decided control of hemorrhage. The two causes of shock are trauma and hemorrhage—and hemorrhage can be largely eliminated.

OUABAIN.*

ITS ACTION IN CERTAIN CONDITIONS OF THE HEART.

CHAILLE JAMISON, M. D.,

AND

PHILIP H. JONES, JR., M. D.,

NEW ORLEANS.

Strophanthus, a species of plant from the family of Apocynacea, has been known to medical science for about fifty years. Juices of this plant, which is indigenous to certain parts of Africa, were used as arrow poisons by the natives. Its pharmacodynamic action was studied in 1865 by Vulpain and Pelikan. A few years later Frazer isolated the glucoside Strophanthin. Since that time a number of Strophanthins

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*Read before the Louisiana State Medical Society, Monroe, April 15-17, 1926.

have been isolated, varying in their compositions and in their mode of action largely according to the manner of their preparation and the particular species of plant from which they are derived. The best known of these Strophanthins are the Amorphous Strophanthin, extracted from Strophanthus Hispidus and from Strophanthus Kombe, and the crystallized Strophanthin, derived from Strophanthus Gratus. For many years, these Strophanthins have been known to have a remarkably prompt and life-saving action. On the other hand, sudden death has only too often followed their use. For this reason, the use of Strophanthin has fallen into disrepute, despite its known beneficial effect; the risk of sudden death outweighing any possible value to be derived. Vaquez believed, and has since proved that the accidents attributed to Strophanthin were due to the fact that the preparations of this drug were not stable. In 1888 Arnaud prepared a Strophanthin, derived from Strophanthus Gratus, and in a chrystalline form, which he called *Ouabain;* this preparation is absolutely stable and invariable in its action.

The action of Strophanthus above all is as a heart poison. Soon after the injection of a lethal dose, the heart beats more slowly, the ventricles contract more and more, and their out-put diminishes, and death occurs when the heart, rigid, contracted and empty of blood, stops in systole. The influence is exerted first on the ventricles; the auricles resist longer. It has been shown that the poison acts on the myocardium itself, and not on the nerve filaments. The action of the drug does not depend on pneumo-gastric stimulation, or on stimulation of other nerves to the heart. *Strophanthin does not seem to act on the vessels.* This opinion was first expressed by Vulpain and Pelikan, and has since been confirmed by the researches of Frazer, Langgaard, and of Otto Vogt. The action of the drug on conductivity has not been so thoroughly studied, though it is stated that the a-c interval is prolonged. The majority of pharmacologists consider the action of Strophanthin identical, or nearly identical, with that of digitalis. It is known, however, that it varies in certain definite respects, and one of the most marked of these is the fact that it is excreted from the body very promptly.

Clinically the drug has certain great advantages; the first of these is that it can be given intravenously and that the digitalis-like action is manifest within a few minutes. It has no cumulative action. It does not constrict the blood vessels. This means that in a serious case of heart failure one can administer *Ouabain* intravenously, at the same time administering digitalis by mouth, and that the action from the *Ouabain* will occur promptly and one does not have to wait many hours for the action of digitalis to become manifest. It fills in that long gap that we know must lapse before digitalis by mouth can show its effect. In dealing with powerful drugs, we must first be certain that the dosage we contemplate can do no harm. We can feel that in the recommended doses *Ouabain* has been proved to be safe at the bed-side, because Vaquez has given over 2,000 intravenous injections without a single mishap. This encouraged me in the use of the drug, and during the last few months I have given seventy-four intravenous injections of *Ouabain* without anything even approaching a detrimental reaction; I have given this drug to cases with Aortic regurgitation, mitral stenosis, fatty and fibrous myocarditis, and have found it of the greatest value, and have seen nothing which would discourage me in its use.

We have given this remedy to fourteen different cardiac cases; one case has received as many as twelve doses. The drug is given in doses varying from 1/480 to 1/120 of a grain, and is administered only once in twenty-four hours. I recommend that four doses be given at intervals of twenty-four hours, and that digitalis be not given at this time. It is always to be given

intravenously. The use of the drug intravenously has no local deleterious effect upon the vein as we have had the opportunity of studying the veins post-mortem in certain of these cases. It is, of course, understood, that *Ouabain* is in no sense curative, but that it is merely a prompt and efficient means of restoring cardiac compensation. Of the fourteen men who received *Ouabain*, six are dead. These six men, however, died at periods varying from several days to several months after the last dose of *Ouabain* was given. We felt that death in all of these cases could in no way be attributed to the use of the drug, as death occurred in no single case sooner than twenty-four hours after the administration of the drug.

Ouabain is indicated particularly in heart failure with aortic regurgitation; a disease in which it is well recognized that digitalis either has no effect or a deleterious one. Following its use, the relief of dyspnoea and the feeling of well-being is marked, although the pulse rate and blood pressure appear to be very little affected, and it is interesting to note that in a large percentage of these cases the blood pressure falls as compensation is restored, rather than rises as one would expect. I attribute the good effect of *Ouabain* in aortic regurgitation largely to the fact that it does not constrict the coronary artery, though I have no way of proving this fact. In any case of acute heart failure (and this means, of course, usually the left heart), *Ouabain* is indicated, and is life-saving. In chronic cardiac failure, particularly where failure of the right side of the heart is the outstanding feature, I have found the drug of far less use. In heart failure, due to mitral disease (the so-called rheumatic heart), I do not feel that any drug is to be compared to a good preparation of digitalis, and I cannot see that *Ouabain* has any indication in this disease except in a sudden emergency. It is worth a try in any case, no matter what the etiology, where digitalis has failed. The continued use of *Ouabain* by vein, or the use of other preparations of Strophanthus by mouth, may bring about nausea and vomiting; this disappears promptly on withdrawing the drug. I can tell you nothing about the action of this drug on the various cardiac irregularities, as I have not yet had an opportunity to use it in such conditions. When extrasystole follows the use of *Ouabain*, it is a warning that the size of the dose should be reduced. My experience does not lead me to believe that the diuretic action of this drug is to be compared to that of digitalis.

In conclusion, I feel justified in stating that the *Ouabain* of Arnaud is an absolutely safe preparation in doses of 1/480 to 1/120 of a grain, given intravenously, not more often than every twelve, and better, every twenty-four hours, and given for four consecutive days only. These injections, however, may be repeated every day for four days, after an interval of several days or a week has elapsed. It is a very valuable drug, far superior to digitalis, in the treatment of the heart failure of aortic regurgitation. It is life-saving in certain cases of acute cardiac dilatation.

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DISCUSSION.

Dr. D. O. Willis (Leesville): This subject was very interesting to me and Dr. Jamison has suggested some things that I would like to have him explain just why he recommends, especially why we should not continue the use of this drug longer than four days.

All through my professional life, my most intimate co-worker has been an eclectic physician and I remember well that for the last twelve years at least, he has used strophanthin and occasionally oaubain, and I have seen some splendid results from the use of it.

I don't recall to just what extent we have ever used the oaubain intravenously, although we have used it that way, but I had never observed it as being necessary to withdraw it within four days or after four doses. His preference for the continued use of the drug, was Abbot's specific tincture, and occasionally I have seen the symptoms that Dr. Jamison speaks of, with nausea and vomiting, arise, where it would be necessary to withdraw the use of the drug. But I have seen patients take this drug, this specific tincture (I have given it to them myself and have seen my good friend, Dr. Jones, give it to them the same way over a considerable period of time with no untoward effects) and I have thought at times that it was fully equal to digitalis in its diuretic effect. I have found it a splendid remedy to eliminate the excess water from the tissues and I would like to have Dr. Jamison tell us why he couldn't continue it more than four days.

Dr. J. A. Danna (New Orleans): Some three weeks ago I got a telephone message about three-thirty in the morning that a very prominent citizen of New Orleans was very, very sick, and from the description of him and my previous experience with him, I thought the best thing to do would be to send an ambulance for him and get him to the hospital as quickly as possible and then see what could be done. Meanwhile I telephoned for a real doctor, who was Dr. Jamison, and we all got there about the same time. The man is over eighty years of age, I think he is eighty-four, and he is an old cardiac case that breaks down every once in a while and has to stay in bed for a couple of weeks to get strong enough to get around on his feet again. He was as nearly dead as I ever saw anybody in my life. He was pale, his pulse was irregular and somewhere around 130, sort of jerky, he had a bronchorrhea and breathing as though he was just about to pull on his diaphragm and let it go.

I saw the most remarkable effect from a hypo of oaubain given intravenously by Dr. Jamison that anybody could ever imagine. That man is living today and I think he is going to get strong enough to run around for a while and break down once more, but I want to testify personally to the miraculous effect of one hypodermic of ouabain.

Dr. S. E. Graham (Lottie): My old father has a case of regurgitation and he has been taking an official tincture of strophanthus for a good many years. I have read, I think by Dr. Smith, that it is dangerous to give strophanthus for a while and then leave it off. He has been taking it continuously for a period of about seven years. I wanted to ask whether or not you would consider it wise to continue the use of strophanthus in his case. He has a rather well marked case of aortic regurgitation and he is now eighty years of age.

Dr. Jamison (closing): I want to thank the gentlemen for the discussion which has been particularly interesting to me because they have told me something I have been trying to find out for the last six months.

This work was undertaken in connection with my service at the Charity Hospital where all of you gentlemen know how prevalent aortic regurgitation is among the negroes. For instance, it has been stated that aortic regurgitation is rare in men under thirty-six. To show you the wealth of material we have, I have six men in my ward now with well marked aortic regurgitation, no question about it, and all of them under twenty. We have learned from years of experience, and if Dr. Lemann were still here he would back up what I say, that digitalis in these cases with aortic regurgitation has very little effect. We have been casting around for years to find an efficient drug, and Arnaud's preparation of strophanthin, which is a crystalline strophanthin derived from Strophanthus Gratus, is invariable in its action. If you give a man a one hundred and twentieth of a grain, you know you are going to give him a one hundred and twentieth of a grain and that action is going

to be just as definite as that of a good preparation of tincture of digitalis. In other words, if you mean to give him a one hundred and twentieth of a grain you are not going to be giving him a twentieth or a fiftieth without knowing it and bring about his death.

Dr. Willis put a question that I am embarassed in answering. The only reason that I have said four days was because I was scared to keep it for much longer. We have gone to five days but we knew that we were dealing with a very powerful drug. We try to be just as careful with our negro patients as we would with millionaires as far as the hospital service goes, and I really have not cared to go very much farther.

Another reason is that we have felt that after using this drug once every twenty-four hours and preferably in the dosage of 1/120 of a grain, we have gotten such remarkable results that we haven't felt it was necessary to go very much farther.

All through the literature (I have rather a large bibliography as I have been studying the subject for months) you will find reference to small dosages of tincture of strophanthus. I have not tried it. I must admit we used strophanthus years ago but were a little afraid of it particularly because of its nauseating effect.

That is purely a personal thing, doctor, that of every four days. I don't like to talk about a thing I don't know and I know by giving it every day for four days you are not going to kill anybody from the strophanthus. He may die of heart disease but you are not going to get the immediate death that occurs when you give a dose of ordinary strophanthin, and it occurs only too frequently and very quick, just like that, within a few minutes. We have not seen it happen and really the number we have given it to is far greater than that cited in my paper.

In answer to Dr. Graham, I should certainly say, yes, keep up the tincture of strophanthus particularly if there is no gastrointestinal disturbance. I should keep it up by all means.

Finally, I remember what a controversy was started at the last meeting of the State Society when an electrocardiogram was mentioned, but here is simply an example of this work. No man at the present time can go with any certainty before a scientific body of men and speak of heart drugs unless he knows what the electrocardiogram shows, because that would definitely show you whether you were getting effects or not. The changes in the wave T and the right ventricular preponderance are definite.

I hope to present this subject in a final view at the next session as we expect to have an electrocardiograph in the hospital. My mere impressions as a physician have some value to me and to my friends; they are of no value scientifically, and I must say that this is largely based on an impression and on observation of quite a fair number of clinical cases but I have not the written proof of the action of this drug that an electrocardiograph will furnish me and until that time I do not care to be dogmatic. I present this to you because I believe it will in time save life and prove of great value in practice. (Applause.)

SURGICAL PROCEDURE IN SPECIAL FORMS OF INTESTINAL OBSTRUCTION.*

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The proper title for this paper perhaps would be, "A Surgeon's Procedure in Certain Forms of Intestinal Obstruction," for it is my intention to bring out some of the points to be considered when seeing a case of intestinal obstruction.

It is not always our good fortune to have cases referred to us with proper diagnosis, and very frequently much valuable time is lost in making a diagnosis. As our mortality is governed to a great extent by an early diagnosis, and the surgical procedure which is necessary, becomes most hazardous, and death occurs, it behooves us not to delay. Our treatment should be prompt, for in no class of cases do we have a condition fraught with graver danger. In order to make the proper diagnosis in any of these cases it is necessary to have laboratory aid, and frequently we are able to determine more nearly thereby just what the condition is and what steps may be safely taken. Recent studies have proven that obstruction in the upper alimentary tract produces toxic condition as a rule, not an acidosis as is so commonly thought, but an alkalosis. The blood findings in such an event are: plus urea, plus creatinine, and minus chlorides. The treatment should

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manifestly consist in the administration of glucose with chlorides. Obstructive billiary lesions with consequent toxemia almost always produce acidosis, with characteristic blood findings which indicate the therapy required. Normally the blood plasma contains 500 to 600 mg. chlorides per 100 cc. of blood. Diminution in the amount of chlorides present results in alkalosis, in which we have a plus combining power of the blood plasma for carbon dioxide. Soon after this there is a rise in the nonprotein and urea nitrogen of the blood. Hayden and Orr believe that the fundamental change consists in the fall of the chlorides, and that this is not due to any great extent to the loss of chlorides through the vomiting of gastric juices, but it is related to the protein destruction. When we consider obstruction at or near the ileocecal valve there is a rise in the blood nitrogen, but no change occurs in the chlorides so that there does not seem to be the same indication for treatment by chlorides as in high intestinal obstruction. They believe that as the chlorides rapidly fall in pyloric or in high intestinal obstruction, sodium chloride intravenously is an excellent therapeutic remedy. They also find that in the toxemia of a high obstruction, sodium chloride be given in an initial dose of one gram per kilogram of body weight, and that the chlorides in the blood be watched carefully to estimate subsequent doses. There has been some very interesting research work done recently in intestinal obstruction by Foster and Hausler that has served to clarify the somewhat confused situation resulting from the numerous divergent theories as to cause. Stone concludes that pressure is an important factor, and that the increased pressure found in obstruction causes absorption of toxins that would not pass through the wall of normal unobstructed intestines. Werelius, of Chicago, believes that death from obstruction is due to liver insufficiency, and cites experiments to substantiate his view. He does not think that bacteria play any special role in causing death from obstruction, unless the bowel ruptures and peritonitis supervenes.

Dragstedt, Cannon and Dragstedt, as a result of experimentation by themselves and their associates, believe that intestinal obstruction tends to the development of proteolytic intestinal bacteria without regard to the character of the diet.

Flomdke *(Minn. Med., August, 1924)* considers the differential diagnosis of acute intestinal obstruction as follows: 1st. Peritonitis—there is usually history of acute infection. 2nd. Acute pancreatitis—usually in obese patients having previous gall-bladder trouble, sudden profound collapse with early pinched expression and cyanosis. 3d. Acute appendicitis—usually within safety period with a rise of temperature, leucocytosis, localized pain, and rigidity. 4th. Acute perforation of duodenal ulcer—history of previous digestive disturbance, pain more sudden, severe, prostrating, and constant. However, as a rule I do not believe that it is the acute conditions that require more study to diagnose but those cases that result from some malignancy, stricture of the rectum, pressure from intra-abdominal growths that come on more or less insidiously. Whatever the cause of the toxemia may be or whatever the cause of the obstruction may be, and I might say regardless of the condition of the patient, the treatment is definitely surgical and prompt.

Severe abdominal pains in a patient should always receive the most careful attention, and no time should be lost in meeting the exigency of the situation. An intense pain accompanied by constipation and vomiting indicates a severe condition; further, when the vomiting becomes fecal, it demands immediate interference.

The first need of the patient is relief from pain, and this is best accomplished by morphine given hypodermically. An enema given and repeated if deemed necessary, but laxatives and purgatives must be abso-

lutely forbidden. If the patient is vomiting, the stomach should be washed out, not only to give the patient relief, but as preventive of the patient inhaling the vomitus while under the anesthetic; or, if we decide on local anesthesia,—stomach lavage is advisable to relieve over-distention.

In the past, surgeons very frequently have used solutions of soda in stomach lavage, and not infrequently left in the stomach varicus amount of soda solution for absorption, doing this under the theory that they were dealing with an acidosis. As I have previously stated, and as has been conclusively proven, we most often have an alkalosis in this type of condition and while I do not approve of any solution being put into stomach, if any is left in the stomach for absorption, it should be sodium chloride, so that the depletion of chlorides under which the body economy is laboring may be lessened.

It is my belief that we should not lose any time either before opening the abdomen, or after we are in the abdomen. I believe that the smallest amount of trauma, the least amount of shock, with as much speed as is compatible with thoroughness and safety, is a necessary requisite in these cases. The mortality in obstruction is still very high. While it is not as high as formerly, it is still too great, and even in the best hands it demands the most careful and expert attention. Ashhurst collected a record of 346 cases of intestinal obstruction with a mortality rate of 69.3%. Guillaume, quoted by Lee and Downes, found in a record of 694 cases that there was 17.5% mortality where enterostomy alone was performed; 48.2% where simple release of the obstruction and 24.8% of the patients died when the operation consisted of relief of the obstruction and enterostomy. The lowest mortality rate was in the group of cases in which enterostomy alone was done, while the next lowest was when enterostomy was performed and relief of the obstruction was accomplished. I will not attempt to take up the different types of obstruction nor try to outline the technique in each individual case, for we should deal with the case according to the pathology found, always having in mind the safety of the patient; however, there are some rules which we are bound to follow. If a diagnosis is made, and operation performed within the first few hours while circulation is still good in the obstructed loop, the bowel should be released and abdomen closed without drainage. If obstruction has existed for a longer period and signs of toxemia have appeared, the obstruction should be released and enterostomy performed. If the patient is extremely toxic, and apparently unable to stand any additional shock, an enterostomy alone under local anesthesia with the least possible manipulation should be done. If the bowel is gangrenous and conditions critical, the gangrenous portion should be excised and enterostomy performed, same being done as low as possible and near the obstruction. Shands reports three cases where enterostomy was done first and resection later, he believing that the patients were too sick to stand a one-stage operation.

It is manifestly impossible in the time at my disposal to consider in detail every case of intestinal obstruction. We have considered intestinal obstruction in general and have laid down points which I consider paramount in relation to its diagnosis and noted the fundamental rules of treatment which apply to all cases regardless of the etiology. I wish now to consider in more detail three conditions which in my experience have accounted for the majority of the cases of intestinal obstruction: 1st, intussusception; 2nd, hernia, and 3d, post-operative obstruction.

In intussusception, which occurs most often in infants, our aim should be and must be, if we expect to tide any of these little fellows over this very serious lesion, to safeguard the infant from shock in every way possible, and combat dehydration. If I may repeat, there is no class of case in which early operation with proper prelim-

inary preparation and fast work as can possibly be done without sacrificing technique. We have three types of operation in this type of obstruction: 1st, Disinvagination. 2. Temporary relief by proximal enterostomy; and 3. Resection. It is not always advisable to resort to disinvagination alone, for where the intussusception has been present for some length of time we frequently have adhesions take place between the two peritoneal coats of the two parts of the bowel and prolonged taxis will not only be of little avail, but may become a dangerous procedure. Temporary relief by proximal enterostomy is advisable where the patient's condition is so feeble as to contraindicate an attempt at resection. That it is valuable in some cases is beyond question, but undoubtedly it is more useful in this type of obstruction than in some others.

Resection in the face of acute intestinal obstruction in infants has been regarded as an operation of last resort; however, Dowd reports a case of resection and an anastomosis in a five-day old baby, but advises against a two-stage resection and particularly cautions against the use of foreign bodies, such as buttons, bobbins, etc. However, Woolfenden, who did a successful resection in an infant, used a Paul's tube in a two-stage operation. It is my belief that whenever a resection is indicated the removal of the obstructed bowel enmasse followed by an anastomosis immediately. Bolling reports a case in an infant five weeks old of intussusception, and Clubbe in 127 operations for intussusception reports seven resections with one recovery in an eleven month old child. Flint also did a resection on a baby three months of age. I have a case which I wish to report here of an eleven months old baby. J. H., Jr., white, male, age 11 months. Family history, irrevelant. Past history was that baby had never been sick before. He became very fretful and soon began screaming so much that his mother called in the family physician. Before the physician arrived baby began vomiting and straining at stool.

Enemas were given with little or no results. Oil was given and enough paregoric to relieve temporarily, and a course of calomel was given later on in the day. The child kept vomiting and straining at stools until now the stools were very small bits of bloody mucous. More oil was given and more enemas—without relief: At 6 a. m. of the fifth day of illness I was called in consultation. After getting the above history of the case, examination disclosed the following: Eyes were sunken, skin pale and clammy, respiration more or less labored, pulse rapid, child almost continuously vomiting or trying to. Abdomen was distended, more or less tympanitic, but on palpation I found a rather large mass in the upper left quadrant, which I decided was an intussusception. I advised an immediate operation, which was readily agreed to. At seven o'clock I opened the abdomen, making an upper median incision from ensiform to umbilicus. The mass was delivered into wound and some effort at disinvagination was made. Seeing that this was going to cause too much traumatism and with history of five days' duration I concluded that there was very likely some adhesions between the peritoneal layers and hence decided to resect the whole mass. This was done, the end of the ileum was closed and the end of the ascending colon was closed. A side to side anastomosis was done and the abdomen closed as quickly as possible. After the abdomen was closed I did the disinvagination of the mass and found that the ileum had swallowed up the appendix, cecum and six inches of the ascending colon, and that I had removed in addition to the appendix, cecum and six inches of colon, eight inches of the ileum. Very much to my surprise and joy the babe made an uneventful recovery, and today is as well as any child.

There is perhaps no etiological factor that will compare in frequency in intestinal obstruction to hernia; and by far the most frequent is inguinal hernia, which becomes strangulated. One might think that a strangulated inguinal herni can be readily recognized, yet as the following case report of one of my colleagues show, such is not invariably the case. The blood picture in this case is interesting and serves to bring out what I have previously enumerated. Mary White, colored, female, 60 years of age. Family history, irrelevant. Past personal history: About 16 years ago noticed a small lump in right groin, not associated with a pain. Consulted physician, who stated that it was a cyst and of no consequence. The lump remained the same size, neither enlarging nor growing smaller. Present illness: one week ago became ill, unable to make the bowels move. Physician called and numerous treatment instituted, enemas of all sorts given. Slight results were obtained for three days, for the past four days complete obstruction with grave prostation. The usual vomiting, distention, etc. Examination: Essentially negative, except for very marked toxemia, pulse 140, temperature sub-normal, mental condition cloudy, marked abdominal distention, small lump the size of a mandarin in the right groin. This mass was not tender; it felt fairly hard as though it were a semi-solid object. Hernia considered, but finally ruled out. Laboratory findings: On first examination, and before hypodermoclysis of saline and glucose. Blood: Total white count 10,000; differential, polys. 81; urea., 49 mg. per 100 cc. Urine: Albumin two plus, reaction acid four plus, acid one plus, diacetic three plus. Treatment: Glucose 20% 2000 cc. with normal saline, 2000 cc. given by hypodermoclysis and intravenously within the following 24 hrs. In addition enemas, which were totally ineffective. Gastric lavage, nothing by the mouth. The patient's general condition became startlingly better although the obstruction was not in any way lessened. Laboratory: Blood urea 33 mg. per 100 cc. Total white, 12,000, differential, 80. Operation then performed: Local anesthesia, midline incision, the intestines small and enormously distended. Exploration revealed that obstruction due to right strangulated inguinal hernia. Incision over lump in right groin as for usual hernioplasty. Sac opened, considerable fluid escaped; omentum in poor condition, piece that was questionable removed, constriction at the neck of sac divided, bowel not gangrenous, returned to the abdominal cavity; repair by usual technique; no drainage. Convalescence uneventful.

We find that age plays no part in strangulated hernia as shown by the following case report. Walter Jones, colored, male, age three years, was brought to me by mother with a history of child being ruptured since birth but otherwise past history was negative. On the day previous he had been unable to have a bowel movement in spite of the fact she had given numerous medications, including blackdraught, castoria, and castor oil and some enemas, and that he was suffering a great deal and had been vomiting all day. On examination I found a rather large mass in right inguinal region which was fixed and painful on pressure. I tried to reduce it but without success. I advised mother of the condition and consequences if he was not operated on immediately. She refused saying that "she could get it back." The next morning she brought the child to my office wanting to know if there was not something besides an operation I could do, which I answered in the negative. She finally consented, very reluctantly, and an hour later I operated, doing a Bassini. The sac was opened and the gut, dark in appearance, was exposed along with a great deal of fluid. After using some warm packs for a short time the color came back fairly well and I decided that the circulation was sufficiently re-established to return it to the abdomen as it was. The wound was closed and the child made an uneventful recovery.

Post-operative obstructions are not uncommon, and we meet with them fairly frequently. When we are sure that the obstruction is in a definite location, incision should be made in this area and if possible a collapsed loop of bowel found. If this is impossible we should explore with the finger and find a distended loop, then we can soon locate the obstruction. In these cases it will doubtless require more than the mere separation of the lymph adhesions and enterostomy is of greatest value here. I recall one case of obstruction following drainage of a ruptured appendiceal abscess occurring on the eighth day and I did an ilec-colostomy. B. S., colored, male, age 35. Family history irrelevant; past history, usual diseases of childhood and two previous attack of cramp colic, but as he lived in the country and not being accesible to a doctor did not have one. Tuesday he was seized by a violent cramp in abdomen and vomiting, the pain becoming more severe and was unable to have bowel movement. Suffered all night and next morning caught train for Vicksburg. I saw him about twelve o'clock. Well nourished, strong negro man, with chief complaint of severe pain in abdomen which had gotten markedly better within the past hour. On examination found that he had a great deal of rigidity over right lower abdomen but the whole abdomen was more or less distended. Blood: total white was 18,000, polys. 84%. Operation was advised and right rectus made to find a great deal of fluid and purulent material in abdomen, and finally the appendix was located, having ruptured at the proximal end. There were so many adhesions that it was not deemed advisable to do more than remove the portion that had sloughed off and insert drainage. After a rather stormy convalescence, he apparently was all right. On the eighth day he was again seized with a severe pain, vomiting and unable by repeated enemas, etc., to get an evacuation of bowels. After trying for awhile we decided he had an obstruction probably from adhesions where the appendix had ruptured and so we opened him up again to find that the ilecocecal region was bound down by adhesions, some fecal matter being present, so we decided that the best thing to do was to let it alone and seek some other relief for him. So we did an ileocolostomy, simply short circuiting the entire area that was bound down. This gave relief and patient made a fairly nice recovery, though the wound drained for some time. However, many of these cases are relieved by simple enterostomy and this procedure is to be advised in most cases. The former belief that after an operation for obstruction, the bowels should always be returned collapsed is a dangerous procedure, and is no doubt responsible for many deaths. We must remember that the intestines can only be emptied by their own peristalsis, and the old method of exploring the abdominal cavity thoroughly in these cases and trying to relieve the distention immediately should be condemned. What we do we should do quickly with the least amount of traumatism possible, as traumatism tends to inhibit peristalsis. As has been pointed out from time to time surgical judgment plays a very great part in the successful management of intestinal obstruction, and as for other procedures in handling the different types of these cases, it must be according to the best judgment of the surgeon. If a type of obstruction presents an acute violent symptom with prostration, weak pulse, and shock, the operation must be done immediately, and the surgical procedure determined after the abdomen is opened. Whatever type the case may be the patient shows certain phenomena already set forth.

The conditions found on opening the abdomen plus other circumstances govern the particular operation indicated, but as I have already enumerated, certain broad principles of treatment apply to all cases. It is by the combination of proper surgery with certain adjuncts, as at times blood

transfusions, that we are enabled to lower our mortality.

SUMMARY.

1. Intestinal obstruction is fairly common. It carries always a high mortality, and if not handled properly, a tragic mortality.

2. We should take advantage of laboratory aid which is definite and which offers information of diagnostic, prognostic, and therapeutic import.

3. It may seem vain repetition that laxatives and purgatives must not be given in acute pains of the abdomen until the cause of that pain becomes definitely established.

4. Sodium chloride has proved its worth in the treatment of the toxemia which accompanies obstruction in the upper alimentary tract. Soda and glucose is to be used in obstructions of the lower tract.

5. Transfusions of blood at times may be the means of reviving what we considered a moribund patient.

6. Surgical judgment plays the leading role, and how much or how little the patient can stand is always a paramount issue.

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DISCUSSION.

Dr. T. W. Holmes (Winona): There is nothing I can add to Dr. Knox's paper—all I wish to do is to stress a few points he made.

With reference to the laboratory aid in diagnosis, that is all right; but I would not lose too much time waiting on the laboratory. The essential thing to remember is that ninety-nine times out of a hundred acute abdominal pain indicates a surgical condition the nature of which it is impossible to tell until we get in. Keeping that in mind, we will catch more of these early cases of intestinal obstruction.

I want to stress the importance of sodium chloride intravenously. It helps a great deal in the treatment of the patient.

With reference to the differentiation of high up obstructions from low obstructions, usually the high up obstructions are acute in character, and the low ones are occasionally chronic, although the early fulminating may be high up.

The doctor spoke of post-operative obstruction. In my judgment the thing that would be the best guide would be pain and distention, and possibly in some cases nausea. If you give a flatus enema and possibly get a little gas the first time and the second time no gas, then that is practically positive evidence that you have an obstruction.

With reference to the two-stage operation in acute obstruction, I think it is the policy of wisdom, depending of course on the condition of the patient, as quickly as possible to go in under local and get that first distended loop and do an enterostomy and be satisfied with that, not try to find the source of the obstruction.

Dr. Sydney W. Johnston (Vicksburg): I do not believe Dr. Knox mentioned the fact that the location of the obstruction has a great deal to do with the treatment and prognosis. Orr and Haden presented a paper at the meeting of the American Association in Dallas last month in which they reported results in duodenal and jejunal obstruction in dogs and the results of trying to build up the chlorides of the blood by jejunostomy. All the dogs died that were treated and if I remember correctly death occurred earlier where jejunostomy was employed than where simple palliative measures were used.

This leads us to believe that in obstructions in the duodenum or jejunum enterostomy will do no good. A radical operation will have to be done. The same results have been obtained and reported by Walters of the Mayo Clinic.

Dr. W. A. Bryan (Nashville, Tennessee): The first point is that there is a definite relation between the results of the operation and the time that elapses between the obstruction and the operation. That is pretty definitely settled, and the point I wish to emphasize is that once we suspect, or are pretty reasonably sure of intestinal obstruction, then is the time to operate. In other words, the less delay the better off we are.

These different types of operation I am not interested in. We have seen these things happen, once in the hands of a master surgeon. I do not think it should change our practice. Everybody says, and I agree, that we should go in, do what we are going to do, and get out. Do not shock the patient, do not allow infection, but be sure to do all you should while you are in there. I saw a case that Dr. Clement operated on, and when he got inside he found a loop over a band; he cut the band and dropped the loop and said the patient would get well. The patient died without relief of symptoms, and at postmortem there was another loop high up in the abdomen and another band just like the first one. In doing any operation I look over the abdomen to see what is going on elsewhere, and in case of large intestinal obstruction while I do not feel warranted in doing extensive exploration, still I think it should be done to a certain degree.

I have been trying for a long time to find out something. How many of you ever operated a case of intestinal obstruction and found no obstruction? Hold up your hands. There are two or three. I have done it several times. There is a condition known as enterospasm. It is a cramp of the gut, as it is usually diagnosed, and there is intestinal obstruction, or appendicitis, or some other acute intestinal condition. The patient has the symptoms of intestinal obstruction, but we should not make up our minds too quickly. He has vomiting, and often stercoraceous vomiting; but these patients do not in any instance I have seen have distention. One of these cases had been going on a week, she had no distention, she was vomiting, she had signs of intestinal obstruction—I could not get anything through her bowels and she could not retain food or water. Heavy doses of protein will in most cases make the differentiation. Another point, it is very embarassing to diagnose any patient as intestinal obstruction and then get in there and say—where is it? He has locked bowel, but where is the lock?

I have treated eight or ten of these cases and I have gotten around more than half of them without operation. These are not all mechanical obstructions, and if we give the patient a dose or two of protein we can recognize it.

Dr. E. M. Holder (Memphis, Tennessee): I would like to ask Dr. Bryan if he ever used diathermy in those cases to keep the intestinal contents hot. Crile speaks of it particularly in operations on the liver to take care of the shock. He is using it but he has not tabulated his work. That will probably be worth something hereafter in that branch of surgery—it keeps the intesal contents normally warm during the operation.

These spastic guts Dr. Bryan speaks of are unusual and are hard to diagnose except by bismuth and barium examination, and when a man is vomiting you cannot make that kind of diagnosis.

Dr. W. W. Crawford (Hattiesburg): In connection with the statement made by Dr. Bryan with reference to acute cases in which the abdomen is opened without actual evidence of obstruction being encountered, I wish to call attention to the fact that acidosis, particularly in children, will simulate the situation described. I have seen more than one case in which all these outward symptoms of obstruction were apparent, and on examination of the urine it was found loaded with acetone—no indican, or very limited, but on trying to neutralize the acetonuria we obtained very gratifying results. You see in many cases of acidosis the exact clinical picture, even to the abdominal pain, suggested obstruction, but yet no obstruction. I remember Dr. Matas visiting me at my hospital some years ago and we had a woman admitted during his visit who gave just such a history, and yet it was not an operative case because the condition passed away, and I very much appreciated what he had to say.

I want particularly to call attention to a case I saw last month, a negro child about five months old, quite dehydrated, and I thought it was a case of congenital pyloric stenosis. We filled the stomach with barium, but when we used the fluoroscope we saw nothing could pass out of the stomach. The child was in a serious condition, so we gave a hypodermoclysis one night and the next morning proceeded to operate. I went in to do an operation for pyloric stenosis, but I did not feel the typical little tumor that is often encountered in these cases. I opened the abdomen, located the pyloric end of the stomach, but found

no obstruction. Then I cast about for the cause of the trouble, and to my surprise I found a piece of the transverse colon that had passed in behind the duodenum and was sticking up above it through a little cylindrical opening. During the period of months which the child had lived it occasionally had more decided symptoms of obstruction than at others. Of course the actual obstruction of the stomach was exaggerated, and because of the pressure of gas in the bowel the obstruction was complete. Occasionally it would get relief by disappearance of gas and would take a small amount of food. Unfortunately, we lost the child, but I report it as an interesting form of intestinal obstruction.

Dr. W. H. Parsons (Vicksburg): This is one of the most serious conditions with which we come in contact. I have been much impressed by the mortality figures Dr. Knox has quoted. Certain it is that in the hands of the average surgeon the mortality is great, and even in the hands of the expert, as Dr. Bryan has noted, the mortality is high.

It would seem that if the fundamental principles that the essayist has stressed, were observed this tragic mortality might be reduced. I believe Dr. Knox is entirely correct in his advocacy of palliative operation only, in the more desperate cases. Of course it is manifestly impossible to do a palliative operation of the nature of an enterostomy in obstruction of the duodenum for the anatomy of the part would scarce permit and certainly not recommend it.

Whereas my experience with these cases, both in years and numbers, has been limited, it has been sufficient to bring my ideas in thorough accord with the tenor of Dr. Knox's excellent paper.

Dr. I. C. Knox (closing): One of the reasons for reading this paper is the practical consideration of the things to which we must give attention, and the things we must eliminate in a case of suspected obstruction.

One point I intended to bring out and did not, is that an intestine can only empty itself satisfactorily by its own peristalsis, and any attempt at repeated or prolonged examination of the abdomen is to be condemned. An enterostomy, done quickly and under local anesthetic, with as little traumatism as possible, is to be advised, and with no extensive exploratory operation inside the abdomen. The patient must be considered—his safety is the first consideration.

REAL AND ALLEGED DANGERS OF THE PREVENTION AND TREATMENT OF DIPHTHERIA WITH TOXIN-ANTITOXIN AND ANTITOXIN.*

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During my third year at Tulane, in 1903, the late Prof. Jno. B. Elliott, in presenting Erlich side chain theory of immunity, ventured the opinion, that, within two, or three decades, the physician would treat his patients more by prevention than by curative means. He pictured the physician of the future, with his caddie, carrying his supplies of vaccines, serums and antitoxins, ready for any infection, to prevent rather than cure. When we review the advances made since Jenner introduced smallpox vaccine, Pasteur rabies prevention, typhoid, diphtheria, scarlet fever and others, truly our beloved professor's dream was prophetic.

In presenting this paper, I am actuated by a desire to be of service. Not a single thought or fact presented, do I claim to be original. My experience with the prevention and treatment of diphtheria is entirely too limited to be of statistical value. But I conceived the idea that I could assemble the opinions and experience of the leading talent along this line. Hence, March 1, 1926, I addressed the following letter to some 82 members of the American Pediatric Society, very kindly furnished me by Dr. W. W. Butterworth of New Orleans; I also addressed a questionnaire to each. Herewith copy of letter:

"Our community has been visited this fall with more diphtheria than usual. People have been reluctant to immunize their children with toxin-antitoxin. Many people are afraid of toxin-antitoxin, and many are reluctant to give exposed children in the family of a diphtheritic protection with antitoxin.

*Read before the Mississippi State Medical Association, Jackson, May 11-13, 1926.

"On investigation I find the answer is this: some physicians are telling their families, that if a child, exposed to diphtheria, is given a prophylactic dose of antitoxin, and later (weeks, months, or years) develops the disease, that it is dangerous to give antitoxin as a curative on account of acquired anaphylaxis; some even making the positive statement that antitoxin will kill a child who has previously had the serum.

"As to using the Schick test to discover the natural immunes, and the use of toxin-antitoxin as a preventive, not so much prejudice exists, and I am prone to believe that lack of investigation of this procedure is responsible rather than fear of the alleged dangers.

"It seems needless to state that I am a warm advocate of antitoxin as an immediate preventive, toxin-antitoxin as a general prophylactic, and Schick testing where practicable.

"My own dear children have been treated accordingly, and I certainly advocate desensitizing by gradual administration where known sensitiveness exists, and in all cases precede full dose by administering few drops to determine if there is any sensitiveness.

"For the sake of our community, and possibly state, I am contemplating presenting a paper entitled, 'Real and Alleged Dangers of the Prevention and Treatment of Diphtheria with Toxin-antitoxin and Antitoxin," before the Mississippi Medical Association in Jackson, in May, and I would appreciate a reply from you to the enclosed questionnaire."

Quite a number in answering referred me to Drs. Wm. H. Park and Abraham Zingher of the New York City Department of Health. I then wrote Drs. Park and Zingher the same letter and sent them the same questionnaire. To date I have received personal replies twenty-four, answers to questionnaire sixty-seven.

In quoting questionnaire I will present each question separately and in order, with analysis of each.

1. If a child is given an immunizing dose of antitoxin and later (weeks, months, or years) for imumnizing or curative purposes receives antitoxin or any serum, what amount of danger do you consider exists on account of previous administration?

15 replied, none.
24 replied, very little.
1 replied, probably none.
7 replied, no real danger, may have serum sickness.
15 replied, none, if desensitized.
2 advised to always inquire as to history of asthma or sensitiveness to horse serum.
3 who unqualifiedly state that only danger is in first dose.

2. How many deaths (if any) in your experience or knowledge have resulted from toxin-antitoxin as a preventive?

58 replied, none.
1 reported 2 deaths in his experience.
Aggregate reported in literature 18.
8 did not reply to this question.

In answer to this question Dr. Isaac A. Abt says:

"I know of two cases where death occurred. One was due to unskillful and bad technique where local infection occurred. The other was due probably to deteriorated toxin-antitoxin."

3. How many deaths in all have been reported, to your knowledge, from the use of antitoxin?

63 replied, none.
3 reported deaths in their experience.
Number of deaths reported, 4.
1 no reply.

4. In the hundreds of thousands of doses of antitoxin used annually in the United States, would not this many deaths have been possible from status lymphaticus or other causes?

35 reported, yes.
16 reported, positive opinion that deaths do occur from antitoxin.
5 reported, don't know.
11 no reply.

Thus it will be seen that to question No. 1, 62 out of 67 in substance advised to disregard the alleged dangers, but advised caution by careful history taking and desensitizing known sensitive children. Of the 67 only one reported deaths in their experience from toxin-antitoxin. Total deaths

in experience 2; aggregate in literature, 8 at Dallas, Texas, 8 at Vienna; total 18. The deaths at Dallas, Texas and Vienna are fully explained by Dr. Park of New York in his letter.

Just here it seems appropriate to quote letters received from Drs. Park and Zingher of the Bureau of Laboratories of New York City, Department of Health.

Dr. Park writes:

"I make the following replies to your questions:

"(1) There is absolutely no danger because of having had previously an immunizing dose of antitoxin. There may, however, be an acceleration of the serum sickness so that a patient may develop a rash within a few minutes rather than a few days with the usual accompanying symptoms. All the deaths I know about have come from first injections.

"(2) The only deaths I know about occurred in Dallas, Texas, and these were due to a mistake in the Biological plant sending the wrong mixture, and in Vienna where apparently straight toxin was sent by mistake. 8 deaths in each place.

"(3) In New York City one death has occurred for about every 80,000 persons injected.

"(4) These few deaths have occurred always in cases of status lymphaticus. It is true that these persons would have died in all probability from some other slight illness in the course of a few years but the immediate cause of death was injection of the serum.

"When we remember that against these few deaths, four or five in number, the diphtheria mortality has been reduced from 150 per 100,000 to about 9 it is hard to believe that people can seriously consider the probable loss of a life by a remedy which at the same time saves thousands.

"A question you do not ask is more or less coming up is whether toxin-antitoxin sensitizes. I have made very careful observation and find that it does produce an effect but it is so slight it cannot be measured.

Very sincerely,

"(Signed) WM. H. PARK."

Dr. Zingher writes:

"The following are replies to your questions:

"(1) There is practically no danger if the second dose of antitoxin or other therapeutic serum is given subcutaneously or intramuscularly. One has to be somewhat more cautious in injecting the second dose intravenously, as a few cases have been reported in which the intravenously administered second dose was followed by rather severe symptoms.

"(2) The deaths reported from the use of toxin-antitoxin in Dallas were due I believe to an exceedingly toxic preparation prepared by a commercial laboratory. The deaths in an institution near Vienna were due, according to a newspaper report, to the use of toxin by mistake in place of toxin-antitoxin.

"(3) The deaths reported from the use of antitoxin have occurred in about one out of 70,000 injected persons; in about one out of 20,000 alarming symptoms developed. (Park.)

"(4) It is quite possible that the deaths were mostly in those suffering from status lymphaticus or bronchial asthma.

"Cordially yours,

"(Signed) A. ZINGHER,
"Assistant Director,
"Bureau of Laboratories."

Of the 67, 64 reported no deaths from antitoxin, whether used as first dose, or repeated. Of the other three, Dr. C. F. Gelston, San Francisco, reported two deaths, and Dr. L. T. Royster, University of Virginia, reported one, and one was reported from New York City. Two reported knowing of a death in the experience of a friend.

To the last question 34 reported yes; 16 reported positive opinion that death may occur from anaphylaxis, and 5 did not know.

Time does not permit me to reproduce each and every name of the leading pediatricians who so willingly answered my letter and filled out questionnaire, or both, but I would feel amiss if I failed to mention certain outstanding authorities as Park, Zingher, Schick, Doull, Hess, Abt, Helmholz, Chapin, DeBuys, Butterworth, who practically agreed in substance with my stand. I would not have you think that I

do not recognize that there is such a condition as anaphylaxis, but my point is, is the danger at all comparable to the risk in not using these protective agents. I shall here refer to an article by James A. Doull and Roy Sandige, published in 1924. See reprint No. 901 from the Public Health Reports—Washington.

"The question as to whether or not to give prophylactic antitoxin would seems to resolve itself into this: Does the family or institutional contact of a case of diphtheria run a greater risk of death from the prophylactic injection of antitoxin or from diphtheria in default of this prophylaxis?

The sensitizing effect of an injection of horse serum is well known, and in certain laboratory animals second injections, after a certain period of time, will produce fatal anaphylaxis. In man, however, although there may be a severe immediate reaction and a hastened appearance of the ordinary symptoms of serum sickness, death following a second injection is extremely rare. In fact, Longcope (1920) in speaking of the immediate general reaction which may follow a second injection of horse serum, states that "the immediate reaction, although it may be severe, has, as far as the statistics of Park and Nemmser and Cuno show, never caused death when the inoculation is made subcutaneous." More recently, however, Dean (1922) has reported the case of a soldier who died shortly after receiving a fourth dose of antitetanic serum.

On the other hand, certain individuals seem to have a natural hypersensitiveness or idiosyncrasy to horse serum, and it is among these that the cases of collapse and of death following a primary injection of antitoxin have occurred. In some instances in which autopsies have been obtained great enlargement of the thymus gland have been found, and it has been considered that death was due to "status lymphaticus." In many cases, also, there is a history of asthma or other respiratory disease which in some instances in children may have been attributable to enlargement of the thymus. In the particular case, to which Hitchens (1923) referred, and which was reported by Sumner (1923) the child's "eyes would become inflamed and her nose would run whenever she took a drive behind horses."

The total number of such deaths does not suffice to determine the risk at issue, as the number of individuals who have received antitoxin is, of course, unknown. From New York City, however, valuable records are available. Park (1923) states that among 105,000 persons given treatment or immunizing injections of diphtheria antitoxin by inspectors of the health department of New York City there were only two deaths attributable to the injections. It is not stated how many of these were therapeutic and how many prophylactic injections, but presumably the great majority were given for prophylactic purposes, as it is stated elsewhere that in the years 1906-1912 77,882 contacts in New York City received immunizing injections. In addition, Park reports that among 30,000 hospitalized cases of diphtheria and 16,000 cases of scarlet fever given antitoxin there had been no deaths from the injections. This record, which is probably the most reliable statistical evidence available, show one death among approximately 75,000 persons treated.

In summarizing the literature it appears that about 10% of family contacts of 10 years or under, who are not given prophylactic antitoxin, subsequently develop diphtheria within 30 days, versus 1.2% attacked who were given prophylactic antitoxin. A difference of 8.8% in favor of children exposed, under 10 years of age, contracting the disease.

CONCLUSIONS.

First, the mortality from diphtheria still remains around 10%.

Second, 10% of exposed children under 10 years of age, without prophylaxis contract the disease.

Third, the susceptibility of exposed children under 10 years being 10% and the death rate from diphtheria being 10%, therefore, it is perfectly logical to conclude that of 100 children, exposed and unprotected, one is going to be lost.

Fourth, the best available records show a mortality from antitoxin of 1 in 80,000 injections of antitoxin.

Fifth, the very latest information shows that while some reports of death from toxin-antitoxin have appeared, this was before the product was standardized.

Now, while admitting some slight reaction in sensitive children, toxin-antitoxin is not only safe, but it is wise to use it in any child from 6 months to 6 years of age. Schick test from 6 to 12 years, protect all Schick positive children in this group and by all means do not hesitate to protect immediately, by prophylactic dose of antitoxin, all exposed children under 10 years of age. Desensitize if history warrants, but give our children the protection they are entitled to in this enlightened age.

As Charles Hendee Smith of New York says in answer to my questionnaire, "Any community which does not immunize with toxin-antitoxin is living in the Dark Ages."

DISCUSSION.

Dr. Felix J. Underwood (Jackson): In my judgment no more important paper has been brought before this Association than the one you have just listened to.

I thought it might interest the members of this Association to have an account of what has been done in the full-time county health departments with reference to this matter. The number of complete Schick tests and the number of toxin-antitoxin administrations made in the counties having full health departments were as follows:

	Schick Test	Toxin-antitoxin
1922	3835	797
1923	2754	1421
1924	1187	1147
1925	5930	6746
1926 (to March 31)	2658	1982
	16364	32093

During the administration of this material for the prevention of diphtheria trouble was encountered in only one county. This was in the spring of 1922, in Marshall County. The director, who was an exceptionally well trained man, had some difficulty with the Schick test. As a result of an investigation the conclusion was drawn that the trouble was with the material sent out by the biological house. This trouble consisted mainly in the development of necrotic areas, and no fatalities resulted. As a result of this work and the work of the medical profession in this State, we have had a downward trend in cases and deaths.

	Diphtheria Cases	Deaths
1921	3095	364
1922	2387	296
1923	1766	173
1924	1217	89

In age groups, children under five years, the deaths per 100 cases were 14.1 per cent; five to nine years, 6.4 per cent; ten to fourteen years, 4 per cent; fifteen to nineteen years, 3.3 per cent, and under one year the death rate was 15.3 per cent.

Dr. W. D. Beacham (Hattiesburg): I believe toxin-antitoxin is as near a positive preventive of diphtheria as any preventive medicine we have, and if it were used we could stamp diphtheria out of the State of Mississippi. Give the children from six months to one year toxin-antitoxin. It is a simple procedure, any doctor can do it in a few minutes, and he owes it to his community.

Dr. Underwood said they only had trouble in Marshall County, and that is true as far as the biological part is concerned, but in Forest County we secured an ample appropriation to give the children the Schick test, and then to my surprise about one-third of the profession rose up in arms against the health department doing this, and said to the mothers: "Do not have your children given toxin-antitoxin; if you do they will have diphtheria." Dr. Hudson rallied to our support and brought his own child to the clinic and I gave it the Schick test. As a result of the antagonism of some of our local doctors we had 35 cases of diphtheria in Forest County last fall, and two deaths. Do not let that happen in your county. It is easy to control. All you have to do is to give the Schick test or any other test and you will know whether they will ever have diphtheria, and you can control diphtheria. It is so easily done if we will only co-operate and put this thing over.

REMARKS ON SOME PATHOLOGICAL CONDITIONS.*

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The surgery of today is based on pathology rather than on empiricism, as was the case not many years ago. A certain amount of first-hand knowledge of pathology is the only safe guide for the surgeon no matter how skillful a mechanical operator he may be. He should be something of a morbid anatomist also and be familiar with the gross appearance of diseased tissues.

While the microscopic side of pathology is of extreme importance for diagnosis or confirmation of gross diagnosis, the surgeon should, nevertheless, be able to recognize from the cut surface most cases of malignancy. A sound surgical judgment must be based on the surgeon's comprehension of pathology.

The essentials of pathology must be gotten in the autopsy room, here the disease processes are seen as a whole. A tumor of the liver is found to be secondary to cancer of the rectum; the spread of cancer can be traced from the stomach over the peritoneum to the ovary; an infarct of the lung is seen to be due to thrombosis of the pelvic veins; a cerebral abscess secondary to a bronchiectasis, sinusitis, etc.

The pathology of the past has been built almost entirely on the findings of the autopsy room and the medicine and surgery of today bear the indelible imprint of that origin, and yet such a method has its shortcomings. The dead house reveals only the end of the process, but surgery and medicine are concerned more and more with the beginning rather than the end, for in the beginning there is hope in most cases. We must try to learn from the autopsy all we can and reconstruct or gain an idea of the beginning. A breast or a uterus infiltrated with cancer or a kidney or knee joint disintegrated with tuberculosis are interesting and important, but convey little hint of the beginning appearance of the process. There are many conditions common to every-day practice that are seldom seen at the autopsy because they rarely prove fatal but many can be studied at autopsy, as incidental to some fatal condition; but better still they should be studied when possible on the operating table in the living subject. The frequency of duodenal ulcer; the appearance of strawberry gall bladder; the much debated relationship of gastric ulcer and gastric cancer and of chronic mastitis to cancer of the breast; the undoubted relationship of tuberculous salpingitis to tuberculous peritonitis, all these are best observed on the operating table. The parts of the body most exposed are the most frequent sites of tumors, such as mouth, stomach, rectum, uterus, and breast are frequent sites for cancer. It is curious also to note that tumors of ciliated epithelium are rare, and in view of the fact that we know so little that is definite about the cause of tumors, we naturally wonder if this particular kind of epithelium is better able to protect itself.

While we know little that is of definite value concerning the beginning of tumors, we realize the importance of diagnosing as early as possible the beginning malignant condition. A process beginning as an inflammatory hyperplasia may gradually assume neoplastic properties. In goitre, hypertrophic prostatitis, in glandular endometritis and in chronic mastitis and in Hodgkins' granuloma are sometimes seen transformations of a functional or inflammatory hyperplasia into a neoplasm. Here the continued effect of an irritant seems to obtain, and we have also the question of momentum of growth. Here it seems that we have a true precancerous condition of wide occurrence. The tissues and cells are in a state of overgrowth intermediate between inflammatory and neoplastic hyperplasia and are often followed by genuine

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malignant tumors, as manifested by the cells increasing in size and in number, becoming displaced from natural connections and losing their polarity and invading and destroying the surrounding tissues. Microscopically they exhibit loss of elastic tissue, have a lymphocytic exudate, fraying of the edges of the epithelium and hyaline changes of collagen. Even though this is true, we must not lose sight of the fact that malignant tumors grow from their own resources and from the same original cells, not transforming normal cells into malignant ones by contact.

Other than clinically, it is generally not so hard to draw an accurate distinction between malignant and benign tumors, it generally being considered that a tumor is malignant which exhibits infiltrative growth, local destructive properties, recurrence after removal, metastasis, local interference with function and general toxic action of absorbed tumor products. Regarding the degree of malignancy, it is generally recognized that the more the tumor cells vary in type from the tissue in which they originate, the more malignant it is. The presence of epithelial pearls does not always mean cancer but only means that it is an epithelial tissue. As to a benign tumor being transformed into a malignant tumor, while it can occur, it is a very rare occurrence in the history of tumors and is based chiefly upon the observation of uterine myomas, and it has been shown that benign tumors are much less liable to this change of type than are the normal tissues to develop malignancy. A tumor process once established at a certain momentum tends to maintain it throughout its course.

There have been many reasons advanced for the emaciation and cachexia often seen in certain malignant conditions. Inanition, mental depression and worry concerning the disease leading to distaste of food, are important factors. There seems to be no specific toxic destruction of protein tissue in cancer and we know that there is no special toxin or poison secreted by cancer cells and leading to cachexia. In fact there is no specific "cancer cell" but rather a form or state assumed by some epithelial cells. The shape of the cell alone must never be taken as a criterion by which to judge the genesis of a tumor. Hence there is no such thing as a "carcinoma cell" or a "sarcoma cell"; the type of a tumor, whether it be epithelial, connective-tissue, or mixed, can be determined positively only by the arrangement of the cells with regard to one another. For this reason extreme caution is necessary in giving an opinion on the character of a tumor from an examination of isolated tumor-cells. In the intestinal canal there may be the factor of mechanical obstruction to interfere with digestion and absorption, or perhaps an ulceration of a carcinoma of the stomach interfering with nutrition. In passing, I might state that I believe it is rare for a stomach ulcer to become cancerous, rather it is the other way, first a cancer then ulceration.

As we know, cancer metastasizes chiefly through the lymph route, and the nodes in the vicinity frequently show secondary growths. Frequently we hear the surgeon refer to lymph nodes or nodules as glands, when strictly speaking we know this is not correct. It is an interesting fact that the implantation of metastases is preceded by a period of preparation of the node. For weeks or months before actual invasion, the node may be swollen and new nodes may develop in the course of the vessel, some of which may be small and fibrous and permit the cancer cells to pass through or around them and lodge in a more distant group of nodes. The comparative immunity of lymphatics against invasion of sarcoma is probably due to the greater local fixation of sarcoma cells as compared to the more movable epithelial cells. There are a few benign conditions which may form metastases such as thyroid adenoma, hydatid mole and placenta and chondroma,

and the secondary tumor may be benign or malignant. The preservation of structural type in metastatic tumors is often remarkable, yet there is usually more anaplasia and more rapid growth, especially after operation. When tumors recur after operation, they are frequently of a different kind or type.

There are many theories as to the cause of tumors, Cohnheim believed that tumors developed from masses of simple or complex tissues implanted during the embryonal development. Remak and Thiersch gove us the idea of cell autonomy, then followed the conception of tissue tension to account for the limitless growth of cells. Ribbert says there is no unusual power of proliferation in cancer cells, that freed from the restraints of tissue tension, they exhibit the power of growth with which they are endowed from the ovum, and Weigert and Roux say that they cannot be increased by any external stimulant. Billroth says "without previous chronic inflammation, cancer does not exist," and so chronic irritation is established as a necessary factor. We know that a tumor is an autonomous ne wgrowth of tissue and that the cells proliferate without control and are subservient to none of the natural laws governing the body. We must remember that a cancer's continued growth is very different from its conception and also it is by no means certain that malignant cells are more viable than normal cells. It has been contended that the cells lose the power to work and gain the power to grow. Nothing about cancer is more generally accepted than its hereditary nature and nothing is less satisfactorily proven. As to the parasitic or germ theory of cancer, time does not permit me to discuss this here.

The traumatism that precedes a cancer is usually a repeated chronic irritation, while that preceding sarcoma is caused by a single blow. It is possible that preceding the injury there may be a benign or small malignant tumor in the part injured. Probably only a few tumors are the direct sequel of trauma, but a slowly growing cancer nodule in a chronic mastitis may be accelerated by a blow when the injury alone seems to be the only cause.

As to treatment of malignant tumors, I will not say much. Operation when performed should be as early as possible. X-ray and radium are valuable in certain tumors, perhaps not being so good in any as in rodent ulcer, which is considered to be a basal cell type of carcinoma and which usually grows above the level of the upper lip. This method of treatment is good also in carcinoma of the cervix. Radium, perhaps, is best in angioma (carbon dioxide snow not being used any more). These remedies, of course, should be tried where there is a probability of help. As a rule, the X-ray is not applicable in a tumor containing keratin. The method of treatment, however, should best be decided by the surgeon after careful study of the case and perhaps after consultation with the pathologist and radiologist.

The subject of bone tumors is now receiving special attention due to the "Registry of Bone Sarcoma" which was initiated and has been conducted for five years by Dr. Codman of Boston as an activity of the American College of Surgeons. About two hundred individuals have registered cases of bone sarcoma in this first collection of some six hundred and fifty supposed cases. A standard classification has been used by Dr. Codman and his committee composed of himself and Dr. James Ewing and J. C. Bloodgood. One of the main objects of the Registry is to get a uniform classification or nomenclature which roentgenologists, clinicians and pathologists can use in order to have a mutual understanding of the clinical entities which are referred to. Briefly this nomenclature is: (1) Metastatic tumors of the bone. (2) Periosteal fibrosarcoma. (3) Osteogenic tumors—benign and malignant. (4) Inflammatory conditions. (5) Benign giant cell tumors.

(6) Angioma (benign and malignant). (7) Ewing's tumor. (8) Myeloma and Borderlines.

When we realize that there are variations and grades in sarcoma and that all clinically so-called bone sarcomas are not malignant tumors, perhaps fewer limbs will be sacrificed; and on the other hand, when we can detect and diagnose true malignant types of Osteogenic Sarcoma and institute early and proper treatment, perhaps more limbs and lives will be saved. From the microscopical viewpoint, as pointed out by Codman, we can feel pretty sure of the following five points:

1. The finding of numerous mitoses in a bone tumor does not necessarily indicate osteogenic sarcoma, but *absence* or *infrequency* of *mitotic figures* should arouse the suspicion that the case is not one of osteogenic sarcoma.

2. Any bone tumor which does not show *pleomorphism* is probably not an osteogenic sarcoma.

3. *Tumor giant cells*: (not universal) but their presence in an osteogenic tumor is a very reliable sign of malignancy, and their absence need not make one suspicious either of the malignancy of the tumor or its place in the osteogenic series.

4. *Differentiation*: In an osteogenic tumor very complete differentiation or almost no differentiation is better than incomplete differentiation, and the evidence of quite complete differentiation should make us suspect that the case is not osteogenic sarcoma.

5. *Vascular arrangement*: Every osteogenic sarcoma shows tumor vessels and a tumor which does not show them in several sections is not an osteogenic sarcoma.

About twenty cases have been worked up for the Registry by Drs. Guy Caldwell, S. C. Barrow of Shreveport and myself, and with Dr. Caldwell's help we will show slides of some of these cases.

DISCUSSION.

Dr. A. A. Herold (Shreveport): In opening the discussion on this interesting talk, I do not care to speak of the details but to recall that about twelve years ago I was chairman of this same section and in those days we read Chairmen's Addresses. My subject at that time was "Pathology as the Basis of Scientific Medicine," and this talk today just illustrates how important it is to have your pathology right.

You all know that in the curriculum of the medical colleges you get your bacteriology and pathology before you get your practice in medicine. You get your surgical pathology before you get your regional surgery, showing that it is recognized in the colleges that pathology is the basis of scientific medicine. That just emphasizes the importance of this section of the Society. I make a plea for more papers of this kind on pathology, the clinical man working in conjunction with the laboratory man and preparing papers on the order of symposia of this Society. I think they are highly interesting and will be of great value and benefit in the future. (Applause.)

Dr. Marvin Cappel (Alexandria): We readily appreciate pathology as the basis of scientific medicine. In the past we relied largely upon our findings in the autopsy room. That was a great deal of benefit to those who were left behind but it didn't help that individual much during our time of administration of medical aid.

It is true that we rely today largely upon our pathological specimens and upon our X-ray findings. It is very essential that we do in the treatment and preservation of tissue of many of our patients. It is conceded that it is necescary for the surgeon to have a comprehensive knowledge of the histology and the pathology of the tissue which is involved. We must not overlook the findings in the postmortem or the autopsy room. That is the point that I particularly want to stress.

It is very interesting and very necessary where possible that we verify our X-ray and pathological findings in the autopsy room. Many of us in the country parishes seem to think that we have not access to this privilege. Thanks to some of our past legislation we have access to perform an autopsy upon any subject where a diagnosis has not been made, and my plea is for more autopsies for the purpose of making a definite diagnosis, not for the good that it does the deceased but for the good that we reap in the future; more particularly for the purpose of rendering a correct diagnosis upon that death certificate which is filed in the Bureau of our Vital Statistics and may be referred to many times in the future for the benefit of those who are left behind. My plea is for those

in the country to avail themselves more of the opportunity of performing autopsies on cases where they are not able to make a definite diagnosis. (Applause.)

Dr. F. M. Johns (New Orleans): A good many doctors look upon a section report as being the last and final word, whereas most of us know that tissue diagnosis is often merely an opinion. Sections of these tumors, for instance, have been passed through forty or fifty laboratories, each one adding to the diagnosis, correcting it or checking it, and which serves the purpose of educating the doctor as well more properly classifying the tumor.

I also look upon the pathologic removal as being a part of the patient's property. Not only is the pathological diagnosis the property of the physician who refers the patient to the laboratory, but it is often extremely necessary in the future consideration of the patient himself. How often, for instance, does a case come to be questioned where a doctor has removed a tumor from the patient and made no mention of it, no section of it or record of it, and the patient has never even been told of the growth that was removed. I think these things that are altered or removed by surgeons should have definite record made of them and the patient imformed exactly as to the proper method of referring back to such information at any subsequent time. In this connection the sarcoma registry is a step in the right direction.

Dr. L. A. Myers (Alexandria): As to the microscopical side of clinical pathology, Dr. Butler mentioned the fact that we have a great variance in nomenclature along pathological lines. Most of the stress has been laid upon large and lengthy names that had really no meaning or pertained little to the clinical significance that would help the patient. I think there is getting to be a little bit better understanding along that line. Dr. Broders has a classification where he tries to grade the degree of malignancy of the epithelial tumors, and I think that is a very nice thing. It seems as though the clinicians should know something about the degree of malignancy rather than knowing something about the length of name.

Our bone tumors is something that has not been worked out quite to that extent, but I think that we will come to the problem of whether or not the tumor is very malignant or partially benign. (Applause.)

Dr. Butler (inclosing): I wish to thank you for the interest shown in the discussion and I want to make a plea for more routine examinations of tissues. It is a routine in our institution in Shreveport where every tissue removed at operation is sent to the pathological laboratory, and it is not surprising to frequently find conditions that were not suspected at all by the surgeon. Even in the routine removal of the appendix, for instance, you may find conditions not suspected at operation.

The next thing is a plea for more autopsies and also to get the doctors to attend the autopsies; that is, the doctor who is interested in the case to attend the autopsy and let us all benefit by it together. In Shreveport Hospital we have routine autopsies on most of the cases, and I am pleased to say that the people have become better educated to it and they are more willing to have autopsies. In a good many cases they are ordered, as Dr. Cappel mentioned a while ago, in an official way through the coroner's office.

The next thing that I think of is the importance of diagnosis as brought out, distinguishing between malignant and benign tumors. For instance, the benign, giant-cell sarcoma. Many limbs have been sacrificed, I think, by diagnosis of sarcoma that was of the benign, giant-cell kind.

Another thing that I would like to insist upon is to have an X-ray made more frequently in bone tumors, and particularly before an operation that an X-ray be made of the chest as we know that is the most usual site of metastasis of bone tumors. Surely if it has already metastasized to the chest, there is no use in sacrificing the limb; let them have it for the few remaining months of their life.

The next thing is in regard to the Registry. I think one of the most forward steps made by the American College of Surgeons is the establishment of the Registry with a uniform nomenclature. If you get a report from one place and one from another, they may both mean the same thing but have used different terms. I would like to ask all of you who have an opportunity to read Dr. Codman's article in the "Surgery, Gynecology and Obstetrics" for March to do so for it is well worth while and enlightening to all of us. (Applause.)

Dr. Caldwell: Mr. Chairman, I have no remarks to make except that I think if anyone who will try to run up a series of cases as this one has been run up, in order to report it, will profit more from it than anybody else. It is one of the most helpful things I ever attempted to do, also one of the most interesting things. It brings out a great many points in your work and the work of others. The work here I think was particularly nice in that everybody co-operated. Every physician in Shreveport who had a case of this nature contributed the case and the laboratories contributed the data. It made it very interesting to work it up to report on it.

COMPLICATIONS OF PARA-NASAL SINUS DISEASES IN INFANTS AND CHILDREN.

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Much has been written about the above condition during the past few years. Many careful observers have spent considerable time and pains in research work along this line, and have given the benefit of their work from various viewpoints according to whether the observer was an Opthalmologist, Otolaryngologist, Pediatrician, Dermatologist, etc.

In preparing this paper I have endeavored to study the question from the viewpoint of the general practitioner, and to you, as such, explain the signs, symptoms and complications, for in the large majority of cases you are the first to be consulted. The cause of many obscure conditions which try the souls of all of us is found in this location, and every one of us should have a working knowledge of the pathology present, to enable us in these cases to make a correct diagnosis or at least to suspect the condition present and call in the proper consultant. Many of these children come to you not because of any nasal disturbance, but because of some complication very remote from the original focus of infection, such as pyelitis, gastro-intestinal disturbances, etc. These conditions were treated routinely by you without determining the underlying cause, and until recent years very little consideration was given the nasal sinuses except in adults.

The question of the diagnosis and treatment of sinus disease in infants and young children has become a very important one. For the past three or four years it has been steadily on the increase. Either there are many more cases than in the past, or we are becoming better observers, and much more careful in our examinations. However, whatever the cause may be we are certainly seeing many more cases of sinus disease each year. Since the influenza epidemic of 1918 these cases are becoming increasingly common. Its results are often very disastrous causing death, invalidism, mental deficiency, etc.

I do not intend to go into the anatomy and pathology of this condition but because of its importance in the explanation of certain obscure complications, I shall outline for you the lymphatic drainage as worked out so carefully by Mullins.

He has shown that the lymphatic drainage from the sinuses is by way of the submaxillary and deep cervical nodes through the cervical lymph ducts, through the great veins, right side of the heart the pulmonary artery to the lungs.

For purposes of discussion these cases can be divided into suppurative, non-suppurative, acute and sub-acute or chronic.

The symptoms of the acute form are prominent and characteristic and the diagnosis easily made. Objectively: excoriated alae, inflamed upper lip, thick muco-purulent discharge, mouth breathing, swollen turbinates both inferior and middle usually covered with the same material, nasal passages occluded. Post-nasal discharge, easily seen on gagging. Shrinking of the tissues in older children, shows the discharge under the middle turbinate and in olfactory fissure. Subjectively: fever, irritability, restless sleep because of inability to breath through the nose, loss of appetite, cough often very troublesome, bronchitis and frequently is added other symptoms or complications in remote parts of the body.

Termination of the condition is in (1) resolution and return to normal, (2) suppuration in one or more sinuses, (3) chronicity.

The subacute type is of more importance to us because of its difficulty in diagnosing in many cases and because of its tendency to cause various complications remote from the seat of infection.

The symptoms vary according to the severity of the infection. In typical cases there may be fever, nasal discharge of a muco-purulent character, swollen turbinates and occluded nares, muco pus in olfactory fissure, post-nasal discharge and a peculiar nasal twang to the voice. Impaired hearing with a redness of the tympanum without middle ear abscess. Frequently these symptoms are modified and we see only a little crusting or scaling just within the vestibule, temperature of from 99 to 100 running over a period of weeks, swollen and congested turbinates. Symptoms that are frequently present and more or less characteristic are sneezing particularly in the morning on arising with or without nasal discharge, coughing especially at night on lying down, irritability, lack of energy, backward in school, easily exhausted, loss of weight and appetite, pale and anemic. Post cervical lymphatic glands palpable. Diagnosis is based on the history which is all important, examination of the nares which is next in importance, and which should be carefully made, transillumination and X-ray.

Complications may also be divided into those associated with the acute and subacute or chronic cases. Many of these are common to both forms. The acute complications are (1) middle ear abscess with discharge persisting until the sinus infection is cleared up. I have frequently seen this same stringy mucoid discharge, similar in every respect to the nasal discharge, persist from the ear until the sinus infection was cleared up. (2) Bronchitis. (3) Acute pyelitis, gastro-enteritis, etc.

Complications associated with the subacute or chronic form are very important.

(1) *Fevers of unknown origin.* These cases are very trying to both the parents and the physician. It is often difficult to establish the focus, but the cause of the majority of them is located in the paranasal sinuses and especially the ethmoids. The temperature runs from 99 to 100 or even 101, usually normal in the morning and up in the afternoon, with perhaps a day now and then free from elevation of temperature. It usually persists over a period of weeks and in some instances months. These patients are usually carried from physician to physician with little improvement. Associated there may be a valvular murmur, which is probably due to the same focus and to which is attributed the fever. Many of these cases I am firmly convinced are treated primarily as an endocarditis, when undoubtedly both conditions are due to a primary focus in the nasal sinus which is overlooked or left untreated thereby permitting constant absorption of toxine which in turn acts upon the weakened heart until in some cases there is permanent impairment of the valve.

(3) *Pyelitis*—particularly of the recurring type. All of you have seen these cases. The case that suddenly develops a high temperature in the evening, down in the morning, and urine filled with pus, clearing up nicely under your favorite alkaline or acid treatment only to return in a month or two or less and run the same course. Absorption of a shower of poison as it were. Perhaps the tonsils and adenoids have been removed with relief of the condition and yet it recurs and you are at your wits end to determine the source of the infection. I have seen quite a few of these cases.

(4) *Nephritis* — frequently associated with pyelitis, but more serious. I have seen repeatedly the presence of albumin and granular casts clear up and disappear under treatment of the ethmoid sinus alone and have seen them return when treatment was stopped too soon or when an acute coryza developed or rather when a flaring up of the old infection occurred due to exposure, indiscreet diet, etc.

(5) *Asthma*—most commonly due to some sinus infection. In every case of asthma I have seen during the past two years I have always been able to find some path-

ology in the para-nasal sinus, relief of which has relieved the asthma. We have ten cases of asthma in children so far in 1926 with relief in every instance, not entirely free from attacks but reduction in number of attacks and their severity. I am convinced that asthma in children is due in the great majority of cases to a nasal sinus infection, plus in some cases a toxemia either from within or without, acting as an exciting cause. The most brilliant results we have seen in this disease have come from treatment of the nasal sinuses. This is not strange when we consider the various ramifications of the branches of the spheno-palatine ganglion, a small ganglion lying in the spheno-maxillary fossa, and anatomically just back of and above the posterior tip of the middle turbinate. It has been shown that the fibers of the cervical symphathetic from the ganglion pass by way of the Vidian and Cartoid plexus and finally to the lower cervical ganglion which is intimately connected with the first thoracic; accelerator fibers for the heart and vasomotor fibers for the lungs, also pass through these ganglia.

(6) *Recurring Bronchitis*—not unusual but often seen and usually in each instance following a flare up of the sinus infection. Every case of this kind should be carefully examined for infection in the sinuses. The nasal sinus disease is explained by recalling to mind the lymphatic drainage of this area as previously outlined in the first part of this paper.

(7) *Gastro intestinal disturbances*—This is usually so severe that it is thought to be the primary trouble. Whether it is due to swallowing the nasal discharge or elimination of bacterial products through the intestinal tract is not known, but probably due to both. Many cases of severe diarrhea in infancy occurring particularly during the cooler months are due to a focal infection especially found in the ethmoid region. McKim Mariott of St. Louis says that in his experience seventy-five percent of these cases are due to infection in the ear or mastoid, but in our opinion infection here is usually secondary to a post-ethmoid infection. Brenneman has particularly emphasized a very frequent and important symptom, namely abdominal pain due to sinus infection. Acidosis is not an infrequent complication. Periodic vomiting is sometimes present.

(8) *Head complications.* Most frequent is acute suppurative otitis media. The majority of these cases are undoubtedly secondary to a post ethmoid infection and clear up only when the sinus infection is well. When incision and drainage of the middle ear does not clear up high temperature in children which frequently is the case, careful attention to the para-nasal sinuses will frequently show the reason for it, and treatment directed to this area will usually bring about the desired result. Unquestionably mastoids have been opened and drained because of a persistent otarrhea which were due exclusively to a post-nasal infection untreated.

Encephalitis lethargica is often found associated with a para-nasal infection. I have seen two cases of this the past year. Marriott reports three. Yates and Barnes in the July Lancet report twenty-three cases in which they found inflammation in and around the sphenoid sinuses in all. Meningitis is an occasional complication. Cervical adenitis is most frequent and a very valuable diagnostic sign. Palpable and enlarged glands in the post cervical chain is very characteristic of sinus infection. Frequently these glands undergo a degenerative change in their center with subsequent kidney complication.

Various headaches and neuralgia, particularly those resulting from irritation of the nasal ganglion. Children around the age of seven first complain of these headaches though Dr. Still in his text-book states that at the age of five years children have complained of headache.

Eye complications are very common such as phlyctenular conjunctivitis, retrobulbar neuritis, optic neuritis, orbital cellulitis and abscess, etc.

(9) *Acute and chronic infectious arthritis*—a very common complication of sinus infection. Dean has reported numbers of cases of this character with usually most remarkable results. We have seen numbers of cases clear up after treatment of the sinuses both operative and non-operative.

It is not my purpose to go into the treatment in detail. Suffice it is to say that the majority of cases yield readily to local and general measures. Some cases need operative interference. A few show gratifying improvement under treatment but are prone to relapse and the disease tends to be progressive. Often many months of treatment at intervals is necessary. Frequently a change of climate is beneficial. Measures looking to the building up of the general system are always necessary. Proper diet particularly is indicated.

In conclusion I wish to emphasize again that in looking for a focal infection an exhaustive examination must be made of the para-nasal sinuses. This must frequently be repeated before sufficient evidence is found in some cases.

Secondly, these cases come to you with practically no evidence or history of para-nasal sinus infection but because of some condition remote from the original focus.

Third, do not overlook the fact that though the tonsils and adenoids have been successfully removed the focus of infection may still be in the post ethmoid sinuses.

Fourth, that para-nasal sinus diseases occurs in children and infants at any age. Dr. Dean reports a case of a seven day old baby dying from this cause, and on which an autopsy showed pus in the ethmoid and maxillary sinus under tension. Many cases are seen in the early months of life.

Lastly, remember that in many cases there may be more than one focus of infection and all must be eliminated. Attention to this point will often prevent great discouragement in the happy final results to which we are looking forward.

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DISCUSSION.

Dr. E. H. Jones (Vicksburg): Dr. Montgomery has treated the matter very thoroughly. If you ever have a case showing the picture he describes it will be so definitely impressed upon you that you will never forget it, and you will recognize a like case. You get an under-weight, undernourished, anemic child, running a little temperature—the general physician has been over her and found nothing; an x-ray of the sinuses may show nothing, yet the symptoms described persist, especially the sneezing in the morning and a crusting in the nares. Following nasal treatment, the patient responds.

Dr. D. C. Montgomery (closing): This may not seem very important, but it is to the general practitioner. These cases are very common, and particularly do the pediatricians see them.

I want to emphasize three or four symptoms that should make one suspicious. One is the sneezing in the morning—that is very characteristic of sinus involvement, particularly the ethmoids. If the x-rays show no evidence other than under-development of the ethmoid cells, that alone is sufficient to make a diagnosis of sinus infection of long standing. These two points especially I want to bring out in closing.

IMPORTANT FACTS IN THE OPERATIVE CURE OF HERNIA.*

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Hernia was the cause of the second largest group of defects among our drafted men. Of the first two million five hundred

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thousand men examined, not less than fifty-seven thousand three hundred seventy-two showed well marked inguinal hernia, and fifty-two thousand two hundred ninety-two in addition showed enlargement of the inguinal ring. Of the former group, thirty-five thousand seven hundred and forty-one or about two-thirds were rejected for any military service; or the latter, eighteen hundred and forty-one were rejected. Altogether hernia or enlargement of the inguinal rings were found in about four per cent of the population of the military age. This percentage will certainly be increased with each decade after the third.

The drafted men from Mississippi gave an incidence of twenty-six and forty-three hundredths per thousand. On this basis there are no less than fifty thousand people with hernia in Mississippi. Berger makes the statement that about one person in sixteen born will acquire hernia.

The modern operation for the cure of hernia is probably the most successful surgical procedure which we have. Prior to Bassini, Wocd in 1886, reported twenty-seven per cent. of recurrences and Bull in 1890 thirty-six per cent. In 1889 Bassini made Padua the Mecca for all herniotomists and his percentage of recurrence was only two and eight-tenths. In 1924 Coley reported ten thousand operations for hernia with a recurrence rate of only about two per cent. Murphy in a very elaborate analysis, reports a gradually increasing rate of from one per cent, under one year, to nine per cent in patients over sixty.

The percentage of recurrence depends on several factors. In children and in young adults with small indirect hernias the recurrence will be almost nil. In fat middle aged and elderly people with large direct hernias the recurrence rate may be as high as ten to possibly fifteen per cent. The type of operation done and the skill and experience of the operator are also, of course, extremely important factors.

If you will consult your actual hospital records you will be surprised to discover what a small percentage of our people are availing themselves of the operative cure of hernia, which is truly a triumph of modern surgery. At the Baptist Hospital in Jackson, in the past three and one-half years, since the hospital was standardized and accurate records kept there have been only seventy-two operations for inguinal hernia, and in ten of these cases the hernia was strangulated—ventral hernia ten cases, three strangulated—umbilical hernia three cases, one strangulated—femoral hernia nine cases, two strangulated. In this time only ninety-four patients have been admitted for the treatment of hernia, and sixteen of these were strangulated. In the same period there have been nine hundred thirty operations for appendicitis, which probably occurs no more commonly than does some kind of a hernia. That is approximately ten per cent of the admissions have been for appendicitis and only one per cent for the treatment of hernia.

At the Charity Hospital in Jackson in the past three years there have been admitted one hundred thirty-five cases for the treatment of hernia. This is a little less than two per cent of the total admissions. Eighteen of these cases were strangulated. At the Jackson Infirmary in the past eighteen months there have been admitted twenty-six cases for the treatment of hernia. This is a little less than one per cent of their admissions. Four of these cases were strangulated.

This should not be, for hernia, while not the cause of many deaths is a very disabling defect, rendering one unfit for any kind of hard physical exertion, and the danger of strangulation is ever present. Our seventeen per cent of strangulations in hernia admissions is rather startling. In three months this year I operated upon four cases of strangulated hernia. In one the patient was eighty years of age, another seventy-six, and in one fifty, the sac con-

tained fifteen inches of gangrenous bowel. We should protect our old age better than this by curing the hernias by surgical means. These cases all recovered, with a radical cure, still strangulation of a hernia is a real surgical catastrophe with great danger to life and calling for very prompt action.

In the U. S. Army—1917-18—the mortality percentage in twenty-five thousand nine hundred ten hernia operations was only twenty-six hundredths per cent. This is probably a true average mortality for competent surgeons, for these statistics include the work of all the Army surgeons in many different hospitals. No other major operation has such a low death rate and the advisability of early operation should be emphasized.

With the introduction of novocain the necessity for general anesthesia in herniotomy has practically been eliminated. Only the very unusual or complicated case requires general narcosis. The statement that the wound heals better after a general anesthetic is certainly not based on fact if a sterile one-half per cent novocain is used as a local anesthetic. Not only is this solution not irritating to the tissues, but the gentleness in manipulation which is necessary with a local anesthetic actually adds primary union. If adrenalin is used with novocain unusual care should be taken to ligate every possible bleeding point so as to avoid the possibility of the subsequent development of a haematoma. Local anesthesia is distinctly the method of choice in the average case.

Time will not permit the detailed description of the various methods of herniotomy. High ligation or suture of the sac is very important. Russell has shown that in children and young adults with oblique hernia this simple procedure gives almost complete freedom from recurrence. Oschner brought out the same fact in connection with femoral hernia.

Seelig and Chouke demonstrated experimentally that red muscle does not heal firmly to fascia. The best results are obtained in large or direct hernias when fascia is sutured to fascia. The general plan of Halsted or Andrews where the fascia of the external oblique is sutured to Poupart's ligament, possesses many advantages over the Bassini operation as it is generally one. Over-lapping and imbrication of the fascial layers with transplantation of the cord produces a very firm abdominal wall. The over-lapping principle as emphasized by Mayo in his operation for umbilical and also for ventral hernia was a very great advance and revolutionized the treatment of these two difficult forms of hernia. Whereas formerly umbilical and ventral hernia operations had a very considerable mortality and often failed to hold, now there is almost no mortality and they practically always hold.

The fascia must be sutured without tension, for it is a rule of surgery that no tissue will heal satisfactorily under tension. If the aponeurosis of the external oblique will not approximate Poupart's ligament easily, the fat should be freely dissected off over the rectus muscle and a liberal longitudinal incision in the external aponeurosis of the rectus muscle made so that the two fascial edges can be readily sutured together. The area over the rectus will not be dangerously weakened for the internal aponeurosis of the rectus and the muscle itself form a firm wall. The separated external aponeurosis will soon replace itself with a firm fibrous tissue. The same principle of liberating incisions in the external fascia a few inches from the hernial opening so as to relieve tension can be used to great advantage in the cure of difficult ventral hernias.

In the management of the sac in direct hernias two points are of especial interest. The bladder not infrequently is found attached to the inner portion of the sac and care must be taken to prevent its injury.

Quite commonly with a large direct sac there occurs also a small indirect sac above the deep epigastric, this small sac invites recurrence of an indirect hernia unless properly extirpated.

On account of its rare occurrence and extreme difficulty of management to the uninformed, mention will be made of sliding hernias. When in a stout patient of middle or advanced age with a good sized hernia, a history is obtained of an inability to retain the protrusion with a truss, a sliding hernia should be thought of. A positive diagnosis can only be made when the sac is opened. Few more disconcerting conditions arise to the uninitiated, than the discovery of the fact that the posterior part of the supposed sac is not peritoneum but some part of the large intestine. There is some danger unless one is informed, of regarding this sliding viscus as merely an adherent intestine within the sac. In his attempt to separate these supposed adhesions there is great danger of cutting the nutrient vessels to this part of the large intestine. These nutrient vessels are, of course, carried down with the sliding intestine. The part of the intestine involved in the sac of a sliding hernia is either caecum, ascending or descending colon, not the sigmoid as is commonly believed. A true knowledge of the anatomy in this condition, demonstrates that only such a viscus, which is only partially surrounded by peritoneum can be involved in a sliding hernia. The intestine which normally lies against the posterior abdominal wall and is partially uncovered by peritoneum slides down and becomes a part of the sac of the hernial protrusion.

Moschcowitz has written at length and most illuminatingly on this subject. He has shown that while it is almost impossible properly to reduce the hernial contents by pushing up from below; that if another incision is made higher up and the involved intestine pulled upward, that it very readily comes back to its normal position and can be held by a few sutures attaching its peritoneum and mesentery to the posterior parietal wall. What has been a large sac is now discovered to be small and possibly only a slit in the peritoneum. A radical cure is now proceeded with in the usual manner.

Sistrunk in these cases advises the removal of the testicle and cord so as to strengthen the closure of the abdominal wall. After having had one recurrence in a large sliding hernia I have given considerable thought to this difficult problem. In a case eighteen months ago this condition was surmised from the history of inability to hold the hernia with any kind of truss. Before operation, which in this case was done, on account of the patient's nervous apprehension and at his request, under a general anesthetic, permission was obtained to remove the testicle if found advisable. In this case notwithstanding the patient has been unusually active in his subsequent physical exertion the radical cure is still all that could be desired.

In elderly stout patients with large direct hernias the radical cure may require an extensive plastic operation. Permission should be obtained before hand for the removal of the testicle if found desirable. Of course this will be indicated in only the very exceptional case; a recurrence is a reproach to our art, and fore warned is fore armed.

Strangulation with gangrenous intestine presents many difficult problems. In the first place it is remarkable how black an intestine will come back to life if given an opportunity. If the bowel is not viable of course some kind of resection becomes necessary. If the obstruction has not existed too long immediate resection with enterostomy above the suture line can be fairly safely done. If the obstruction has been long continued and the patient toxic, the procedure emphasized by John Young Brown twenty-five years ago is certainly life saving. He advised that the diseased

bowel be smply brought out through the wound for drainage, and the suture of the bowel ends and the closure of the hernia reserved for a subsequent operation. In a personal recent case of this kind a suprapubic midline incision was made and the gangrenous bowel brought out through this opening after the plan of Mikulicz. A radical cure was done on the hernia after the removal of the testicle, which was atrophic and undescended. After the removal of the testicle and cord the radical suture of the hernial opening can be done almost as quickly as the ordinary closure of the abdomen. In this case after three weeks a crushing forcep was applied in the open ends of the small intestine to cut through the spur and a few days later the intestinal continuity re-established with no great difficulty and without opening freely into the general peritoneal cavity.

In conclusion the successful radical cure of a hernia is a procedure which gives a patient relief for the remainder of his life. There is no sane reason in breaking the speed limit in getting the patient out of bed. The suture line is stronger immediately after a properly performed operation than it is at the end of ten days. No safe engineer would build a concrete dam and turn on the pressure of the water before the concrete had properly set. In small indirect hernias this does not make very much difference, but in a large direct hernia with much intra-abdominal pressure the patient should be kept in a recumbent posture for two and one-half or three weeks. There is always more danger in the recurrence of a hernia than in the development of hernia after a clean abdominal incision higher up.

DISCUSSION.

Dr. John Darrington (Yazoo City): I have known this essayist for many years and when I see his name on a program I am always sure we will hear a paper full of common sense—one of great value to us all—as we have heard today. He has brought up a subject that is very common, a condition that very frequently comes under the observation of the general physician, but I did not know it was quite so common as his paper would indicate.

Hernia is a great handicap to a laboring man, and there are only two treatments—one is to wear a truss, and the other is to submit to operation. The latter of course is highly desirable, but many men start to wear a truss and continue it through life, with great danger of strangulation occurring at any time; then as they grow older the tissues relax and the operation is much more difficult and recurrence much more likely.

He speaks of sliding hernia. If some young surgeon were to ask me to make a good wish for him, it would be that never during his life would he be called to operate on a sliding hernia, under local anesthesia, before an audience. I have tried it, and I was lost. We read of these explorers hunting big game in South Africa, but I do not believe a man could be so badly lost in South Africa as he is trying to do this operation. You must experience that before you really appreciate the difficulties.

The essayist has given us statistics rather than details of the operation. I do think there is no one operation that stands out clearly as being more effective than any other. You must adapt the operation to the case. In young people almost any kind of operation will prove satisfactory, provided the sac is ligated high, and provided the nerve supply is so conserved and the wound is dry, and that there is no infection. As you get into hernias in older people the per cent of failures will increase, so your statistics would have to be divided between young people, middle aged and old people, and those with constitutional disease.

Dr. Robert H. Foster (Laurel): There are two points I would like to stress, and one is the use of novocain. Dr. Shands says he uses one-half per cent with adrenalin. We use 1 per cent and no adrenalin, and I have never seen any trouble. I would like to stress that and have you carry it back with you, because there is a great deal of prejudice against local operations because patients think they will not heal as readily as when operated under ether. During the war, and up until now, we operated quite a few hernias, as those of you who were in the service know—we had hernias morning, noon and night. But we have come to where we will not operate under general anesthesia if we can persuade the patient to let us operate under local. One point is that operating under local helps one to find the sac. If there is any difficulty in locating the sac, have the man strain or cough and you immediately find it.

As Dr. Shands says about ligating high, if you give your patient scopolamin and morphin followed by one-half or 1 per cent novocain, there will be very little pain attached to the operation and you can separate the tissues and ligate as high as possible. When that is done, unless it is too large, the rest is easy.

Dr. H. R. Shands (closing): My object in reading this paper was to call attention to the hernia statistics of the various Jackson hospitals. In Mississippi of course we have very few large corporations which require a physical examination of their employees. For this reason the percentage of hernia operations done in Mississippi is small. I was surprised to discover what a small percentage of people with hernia are operated upon in this section of the country. I feel that the people should be enlightened in connection with the danger of strangulation of a hernia and as to the amount of disability it causes. The fact that a hernia operation is generally successful, practically free from danger, can be done without putting the patient to sleep, should encourage more herniotomies.

SURGERY IN DIABETICS.*

I. I. LEMANN, M. D.,

NEW ORLEANS.

The advent of insulin has served to arouse the greatest interest in. all topics related to diabetes. Insulin has, therefore, been a boon not only in its application to treatment but in spreading all kinds and bits of knowledge concerning diabetes. Much that was already known in pre-insulin days is only now coming into general attention. This is to a large extent true of the chapter of surgery in diabetes. Some idea of the increased interest in this field is suggested by the fact that in the first eight volumes of the Cumulative Index of the Journal of the American Medical Association, namely for the years 1916-1923 inclusive, there appeared a total of six titles of articles upon this subject, whereas in 1924 there were ten titles and in the 1925 volume there were seventeen titles; thus in the latter year there had been published more papers than in all the first eight years together. The general impression in former years was that surgery in diabetics was surgery that had better not be done. Diabetes was accepted by most surgeons as a sign: Touch me not. And yet there had already been many experiences to indicate that this extreme view was unjustified. Naunyn[1] pointed out that "since Rosen, Israel and Koenig had placed the importance of antidiabetic (dietetic) treatment and of thorough antisepsis and asepsis in the proper light, capital operations have been performed (upon diabetics) with the best results even in the presence of a high grade glycosuria." Twenty years later Joslin[2] in his second edition wrote: "The more I see of diabetic surgery the less difference I observe in it from surgery of the non-diabetic." He again stresses the elements favoring surgical success:

"A. Good medical care before and after the operation.

B. The method of anesthesia.

C. Employment of asepsis rather than antisepsis.

D. Avoidance of trauma."

Strouse[3] in 1916 reported from the Michael Reese Hospital of Chicago that of 338 diabetics admitted in fifteen years, there had been 17.8% deaths. Thirty-eight of these diabetics had been operated upon with 31.3% deaths. Twenty-two cases had been operated upon for sequellae of diabetes with 27% mortality. Eight patients who had been properly prepared had been operated upon without a single death. Strouse quoted Karenski's statistics: 225 diabetics operated upon with 21% mortality (15% from coma) and commented that Karenski believed in proper preparation whereas Fischer who did not believe in preparation had a mortality of 48.8% in 86 cases. Fitz[4] in 1920 reported from the Massachusetts General Hospital that in the years 1913-17:

*Read before the Louisiana State Medical Society, Monroe, April 15-17, 1926.

386 diabetics had been admitted,
54 (14%) had surgical complications,
45 had been operated upon,
20 had an acute infection (50% mortality),
25 had no acute infection (12% mortality),
9 had no acute infection and were well prepared (0% mortality).

He concluded that:

1. No diabetic is as good a surgical risk as a normal individual.
2. No diabetic with an acute infection is as good a surgical risk as one without infection.
3. Prolonged course of preoperative treatment whenever possible is essential to minimize dangers of operation.
4. The risk of any operation for a properly prepared non-infected diabetic is slight, but local anesthesia or gas-oxygen are safer than spinal anesthesia or ether.

Berkman[5] in 1921 reported 159 operations of all kinds on diabetics at the Mayo Clinic with a mortality of 5.03%.

Since the advent of insulin Adams and Wilder[6] have reported from the Mayo Clinic in the period October 1, 1921, to October 1, 1923, 327 operations on 251 diabetic patients with a mortality of 1.2%. The mortality for major operations was 2.8%, for abdominal operations 4.2%. See footnote.*

E. H. Mason has given the experience at the Royal Victoria Hospital, as follows:

Before insulin was available: 41 operations, operative mortality 22%, after insulin was available: 60 operations, operative mortality 15%.

N. B. Foster[8] reported that the operative mortality in diabetes in the New York Hospital dropped to about 12% in the first year of insulin (103 cases, 12 deaths). In this hospital the mortality rate for 160 diabetic patients operated upon from 1897 to 1922 (pre-insulin period) had been 38.6%[9].

In the histories of 407 cases of diabetics I have seen, I find notes concerning operative procedures in 43. There has been but one post-operative death and not a single post-operative infection. These 43 patients were operated upon by 25 different surgeons. Chiefly, these operations have been performed since insulin days, though insulin was not invariably employed in preparation or after treatment; thus in 14 cases insulin was not used in preparation. This group of 14 cases without insulin included:

2 emergency operations for acute appendicitis,
1 laparotomy for papilloma of the ovaries,
1 laparotomy for carcinoma of uterus,
1 laparotomy for carcinoma of stomach,
1 amputation of fingers for infected gangrene,
1 amputation of leg for infected perforating ulcer of the toe with gangrene.
1 tonsillectomy,
1 incision of perirectal abscess,
1 infected perforated ulcer of plantar surface,
1 cataract operation,
1 operation for glaucoma,
1 suprapubic prostatectomy.

Of these fourteen patients, ten had a general anesthetic, two of them developed coma and were rescued by insulin. One of these two patients came under my care only subsequently in order that her diet and insulin dosage might be regulated. The other was referred to me while she was in coma following ether anesthesia. The diabetes had been diagnosed only after the operation and after the appearance of the classical Kussmaul air hunger and other signs of impending coma. Of the other eight cases taking a general anesthetic and

*Judd, Wilder and Adams have just reported in the Journal of the American Medical Association **86**, p. 1107, April 10, 1926, that between October, 1921, and October, 1925, 667 operations have been performed on 497 patients, 363 minor operations and 304 major operations; of the minor operations there had been two deaths, of the major operations there had been eighteen deaths, a total of 20 deaths in 497 patients, or a little bit more than four per cent, twenty deaths in 667 patients or three percent.

not taking insulin in preparation, four occurred before insulin days, four were operated upon while not under my supervision. They were apparently of very mild grade. Two of the ten patients who were given a general anesthetic (ether), as already related, developed coma and were rescued by insulin. Thus is emphasized once more the great desirability of preparing diabetics in anticipation of an operation and an anesthetic.

In twenty-nine cases where insulin was used, a general anesthetic was employed in twenty instances, local anesthesia in six instances and spinal analgesia in two instances. In one case no anesthetic was employed. We have studied the CO_2 combining power of the blood plasma in fourteen cases where a general anesthetic (ethylene gas) was used in combination with other measures presently to be described. The blood was taken before the anesthesia and an hour after the anesthesia. In every case we were able to observe that there was not the slightest indication of acidosis. The following tabulation of cases is set down in order to afford some idea of the gravity of the surgical conditions through which diabetes may be successfully carried.

When one has seen a diabetic coma safely and serenely through the stormy perils subsequent to a ruptured appendix with free pus and feces in the abdomen, one has again the thrill he experienced in the rescue of his first diabetic coma cases. There results a reliance upon the efficacy of insulin properly used that is hardly paralleled in other fields of medicine. "Diabetes is one disease that may be handled with almost mathematical precision." The following case will serve to illustrate.

S. W. 2710, age 52, had been a diabetic for at least three years. He had weighed 225 pounds in 1920 and weighed 185 pounds when he came under observation in early November, 1925. He was non-co-operative in our attempt to reduce his blood sugar from 235 and to free his urine from sugar. The glycosuria ranged from traces to 1 per cent. On November 30th he had violent pain in his abdomen and his bowels moved four or five times, the movements being firm, not watery. His temperature was subnormal, his pulse 76. He was sent home to bed with instructions not to eat. He was better the next day and so much better on the third day that contrary to advice he rose, ate a hearty breakfast and went to the Hotel Dieu where his wife was under treatment. There he had agonizing abdominal pain and collapsed. Dr. Maurice Gelpi saw him at once. The temperature was 99°, the leucocyte count was 30,200, with 93 per cent polymorphonuclears. Within the hour he was on the operating table. Ethylene gas was used. During the anesthesia 20 c.c. of 50 per cent. glucose (ten grams) were given intravenously and twenty units of insulin hypodermically. Before the anesthesia the blood sugar was 60 mgs. and the CO_2 combining power of the blood plasma was 54 volume per cent. The operation revealed a ruptured gangrenous appendix with pus and feces free in the abdomen. Coffer dams of cigarette drains were inserted to localize the process and no attempt was made to explore or to remove the appendix. The patient awoke on the table and had no nausea. Two hours after the operation the blood sugar was 190 mgs. per 100 cc. and the CO_2 combining power 50 volumes per cent. The first post-operative orders were:

1. Rectal drip of two per cent. glucose.
2. Insulin every four hours in doses according to the intensity of the Benedict qualitative reaction.

It was necessary to catheterize and to leave the catheter in situ to obtain the necessary specimens. In the first twenty-four hours he received 68 units of insulin. The second day he was allowed non-residue liquids including sweet drinks (coca cola) and sweetened coffee. This regimen was continued for several days; gradually the diet was enlarged as in any non-diabetic patient to include milk and cereals. The insulin was administered every six hours, the total twenty-four hour dose ranging from twenty-four to forty units. When the patient was definitely convalescent from the surgical standpoint, the diet was put on an exact measured basis and the insulin dosage was adjusted to bring the blood sugar to normal. On a diet of carbohydrate 65, protein 50, fat 150, about fifty units of insulin daily were required. The patient remained in the hospital for two months. Two subsequent operations under local anesthesia were required to approximate the edges of the tremendous gap in the abdominal wall. During the first week after his original operation, superficial gangrene developed at the end of the toes on both feet. This was treated by constant exposure to electric light. The end result was

CASES TAKING GENERAL ANESTHESIA.

No.	Age	Diagnosis	Operation	Anesthesia	Insulin	
1953	22	Peri-rectal abscess	Opened	Ether	No	Post-operative coma. Insulin rescue
2548	73	Gangrene of toes	Amputation of one-third of leg	Ethylene	Yes	
2562	63	Gangrene of foot	Amputation of leg	Ethylene	Yes	
2396	58	Gall bladder (gangrenous)	Cholecystotomy	Ethylene	Yes	
2318		Gangrene of foot	Amputation of leg	Ether	Yes	
2331	51	Gangrene of foot	Amputation of leg	Ethylene	Yes	
2279	19	Abscess of mastoid region	Incised	Ethylene	Yes	
2250	47	Gangrene of foot	Amputation of leg	Ethylene	Yes	
2194	60	Acute appendicitis	Appendectomy	Gas and oxygen	Yes	Insulin only subsequent to operation.
2190	62	Carcinoma of the pancreas	Exploratory	Ethylene	Yes	
2156	64	Appendicitis	Appendectomy	Ether	No	
1886	59	Papilloma of the bladder	Exploratory	Ethylene	No	
2260	25	Tonsillitis	Tonsillectomy	Gas and ether	No	
2503	48	Carcinoma of the stomach	Exploratory Laparotomy	Ether	No	
1287	68	Infection of the fingers	Amputation of the fingers	Ether	No	
1925	16	Pregnancy	Uterus emptied	Ethylene	Yes	Pre-eclampsia.
2712	50	Abscess of finger	Incised	Ethylene	Yes	
1843	17	Gunshot wound	Amputation at shoulder	Ether	Yes	
2636	63	Gangrene of toe	Amputation of leg above knee	Ethylene	Yes	
2170	54	Carcinoma of the pancreas	Cholecystenterostomy	Ethylene	Yes	
2786	50	Abscess of back	Incised	Ethylene	Yes	
2319	73	Gangrene of foot	Amputation of leg above knee	Gas and ether	Yes	
2762	56	Gangrene of foot	Incised	Ethylene	Yes	Wonderful result from conservative surgery.
430	55	Papilloma of ovaries	Laparotomy	Ether	No	Pre-insulin.
407	44	Acute appendicitis	Appendectomy	Ether	No	Pre-insulin.
750		Perforating ulcer of toe—gangrene	Amputation of leg	Ether	No	Pre-insulin.
2438	58	Carcinoma of the uterus	Abdominal hysterectomy	Ethylene	Yes	
2710	52	Appendicitis	Appendectomy	Ethylene	Yes	Ruptured gangrenous appendix. Free pus and feces in the abdomen.
1976	74	Carcinoma of the uterus	Excised by cautery	Gas-Oxygen	No	

CASES WITHOUT GENERAL ANESTHESIA.

2026	63	Epithelioma of ear	Excised	Local	Yes	
2564	53	Abscess of lung	Resecting of rib, drained	Local	Yes	Died suddenly—few hours after operation. Conscious. Not diabetic death. No autopsy.
2502	75	Cataract	Extraction	Local	No	
48		Infected perforating ulcer of plantar surface	Incised	Local	No	Insulin subsequently.
2297	57	Glaucoma		Local	No	
2382	64	Carcinoma of the cervix	Vaginal hysterectomy	Local	Yes	
2350	22	Tonsillitis	Tonsillectomy	Local	Yes	
1915	45	Cellulitis	Incised	Local	Yes	
2146	41	Carbuncles	Incised	Local	Yes	
2547	65	Extensive Cellulitis of back and neck	Incised	None	Yes	Violent sepsis. Died.
2045	59	Gangrene	Amputation of leg	Spinal	Yes	
2642	43	Ulcer of toe	Amputation of leg above knee	Spinal	Yes	
2615	80	Prostatitis	Prostatectomy	Spinal	No	Very mild diabetes.

most gratifying for the process was limited and not the smallest part of any toe was ultimately sacrificed. The patient has been restored to complete activity and is able to take an ample diet, carbohydrate 80, protein 60, fat 150, with two doses of insulin daily, 26 units before breakfast and 22 units before his evening meal. He says he feels now much more vigorous and energetic than he has for years.

Infection of any sort is badly borne by a diabetic. It depresses his tolerance and increases the risk of acidosis. Infection, therefore, is an indication for prompt surgical intervention in a diabetic. The risk of an operation when safeguarded by insulin and other measures such as the provisions of adequate fluid and adequate carbohydrate food is far less than that of the infection. Clean cases requiring operation for conditions unrelated to the diabetes, on the other hand, are more advantageously attacked after a preliminary period of preparation by diet and insulin (when necessary), assuring freedom from acidosis and a storage of glycogen reserve provided by a liberal carbohydrate diet. It has been our custom to provide a diet of eighty to one hundred grams of carbohydrate, about two-thirds grams of protein per kilogram of bodyweight and not more than eighty grams of fat for some days in advance of the operation. We insist on the absence of acidosis and try to have the urine free from sugar and the blood sugar level normal. These two latter requirements have usually been complied with. If the operation is to be done in the early morning, an additional feeding of carbohydrate food, together with a dose of insulin is provided at midnight. Usually an intravenous injection of ten grams of glucose (20 cc. of fifty per cent solution) is given on the operating table with insulin ten units hypodermically or into the vein. We feel that by doing this we tide over the period of starvation that precedes and follows the anesthesia. It has been our almost invariable experience with ethylene anesthesia in connection with this procedure that patients awaken on the table at the conclusion of the operation and never have the slightest nausea. If there is no nausea, feedings are begun four hours after the operation in all but abdominal cases. These feedings of ten grams of carbohydrate (=100 cc. of orange juice, or 180 cc. of skimmed milk, or 5 tablespoonful of oatmeal gruel) are given every four hours. Insulin is given with each feeding in doses graduated according to the grade of glycosuria. This latter is roughly determined by the Benedict qualitative test—an exceedingly simple procedure which is carried out by the nurse. The urine must be tested by her before each dose of insulin. It is often necessary, therefore, to pass a catheter and leave it in situ during this period.

20 units of insulin are given if the Benedict test is red,

16 units of insulin are given if the Benedict test is yellow,

10 units of insulin are given if the Benedict test is green,

No insulin is given if the Benedict test is blue.

Gradually the diet is increased and the insulin dosage is arranged so that within the week or less the patient is back upon his usual maintenance diet and with his usual pre-operative insulin dose. In addition to this regime it is sometimes necessary to provide adequate fluids by hypodermoclysis or by rectal drip. This is particularly the case, of course, in abdominal operations where fluids by mouth may not be permitted. For the hypodermoclysis we use only normal saline. For the rectal drip five per cent glucose furnishes the carbohydrate when this cannot be taken by mouth. In general, I have tried to adapt my post-operative recommendations and orders to the customs and views of the surgeon when dealing with similar conditions in a non-diabetic. For example, the first nourishment permitted post-operatively in abdominal operations is sweet non-residue liquids. Here, in New Orleans, coca cola is a favorite with the surgeons. I have

co-operated with the surgeons in permitting temporarily these sweet drinks in the first post-operative days, providing insulin as above outlined to take care of them. I believe, however, we must insist upon their withdrawal promptly and the substitution of unsweetened carbohydrate food at the earliest possible moment because of the necessity of impressing the patient with the importance of avoiding sugar and sweets in the future; otherwise the discipline is hurt and the patient receives the impression that an indefinite amount of sweet drinks may be consumed.

SUMMARY.

1. Surgery in diabetics has been made vastly safer since the introduction of insulin.

2. The post-operative mortality should not be greatly in excess of that of normal people provided proper safe-guards are observed.

3. The old fear of surgery in diabetics is justified when these safe-guards are not observed.

4. Infection must be relieved promptly in diabetics.

5. It is highly desirable to prepare the non-infected patient by a preliminary dietetic (and insulin) treatment to insure freedom from acidosis and a normal blood sugar level.

6. Close co-operation between the surgeon and the physician directing the handling of the diabetes is essential to success.

DISCUSSION.

Dr. W. P. D. Tilly (New Orleans): I wish to say that just at this time when we are doing more surgery with diabetic cases, this paper is very interesting subject matter to us. In our clinic in the past two years we have had quite a number of traumatic injuries and in these injuries we did the work before we made the laboratory report. In many cases it was the next morning after the operation that we discovered we had diabetic patients to deal with. Dr. Lemann has especially pointed out how to prepare the patient before the operation, but many of us in the past have been sending patients into the hospital without due examination. We make a diagnosis of appendicitis or acute surgical abdomen, and very often we fail to make sufficient examination to determine whether we have a diabetic patient or not. Many cases have been operated on in the past without sufficient examination.

The thing that I want to stress would be that all patients that are sent into the hospitl be thoroughly examined before their admittance. Very often we have patients who are given just a passive examination and the real examintion is not made. We operate on these cases and the next day or the third day our laboratory report shows possible diabetic cases. What shall we do with them? We find out from blood examination as soon as possible what type of diabetes we are dealing with. Then we institute insulin treatment in full doses and place our patient on special diet.

In traumatic surgery of the brain, very often we have sugar. These cases are not always diabetic. They are simply temporary conditions that will pass off in a few days, but in minor surgery very often we have patients who are working daily and do not know that they have sugar. There we have to care for our traumatic injuries immediately and a few days after we discover we are dealing with diabetic cases It is just as important to deal with these cases in a rigid manner and give them full dose of insulin and keep their diet properly cared for so as to get results from our surgery.

An interesting case came to me, just a year ago, with a gangrenous hand admitted to the hospital. I believed said case was due to sugar. I sent for my laboratory man and had it examined. The sugar was over four to six per cent, if I remember. I didn't have a chance to make a blood sugar then but I simply bored the gangrenous sections of the hand. Then I called in consultation Dr. Randolph Lyons in this case, and we made a thorough examination and gave a full report. We injected as much as sixty units a day of insulin in that case. In the past in our clinic we would have amputated that arm, way up. That lady was nearly eighty years old. She made a perfect recovery. That proved to me the importance of injection of insulin in full doses to tide these patients over until we can care for them.

Dr. W. Marvyn Johnson (New Orleans): Until the last few years patients with diabetes often failed to receive the assistance of the surgeon because of fear of the results of operative interference. On the other hand many optional procedures formerly undertaken resulted in diabetic coma, probably because of lack of control of the disease prior to and following operation. During

the last few years there have been distinct advances in the management of diabetes, particularly through the introduction of insulin, and in the light of this newer knowledge it seems important to determine the present status of diabetic patients who have surgical conditions. It is quite evident that all diabetic patients do not have the same type as regards severity and prognosis, consequently we find that we may classify them into four groups, namely: (1) Acute progressive diabetes with sudden onset of symptoms, tendency to lose weight and strength rapidly and a tolerance for sugar. This is the severe form and occurs most often in young adults and children. (2) Obese adults who have a gradual onset of symptoms. (3) The vascular type of the disease—common in middle-age and elderly persons with demonstrable atherosclerosis. The onset is gradual and does not usually incapacitate the patient. (4) Adults—form of disease doubtful; onset gradual, patient not over-weight and do not have atherosclerosis. The diabetic patient who is to undergo an operation should be observed, his tolerance estimated; his blood sugar determined at frequent intervals and appropriate measures instituted to control acidosis, if present. Finally he should be established on the dietary plan described by *Wilder and insulin given if necessary During this period an attempt should be made to determine the part played by the condition or lesion. If, for example, the patient has diseased tonsils the carbohydrates in his diet are raised to 100 gm. daily for 3 days before tonsillectomy, affording adequate glycogen reserve. Insulin should be used if necessary to aid in metabolizing this diet. On the morning of the operation no food, 10 to 20 units of insulin may or may not be given, depending on the type of case. Five hours after operation soft and liquid foods may be given. Soft food rich in carbohydrates are permitted and sufficient insulin administered to ensure the burning of glucose and to prevent or minimize any tendency toward acidosis. Traces of sugar in urine at the itme are disregarded but no effort is spared to keep the patient free from acidosis. When the patient is again able to tolerate solid food he should be reestablished on his regular dietary regimen and insulin dosage. Local anesthesia (cocaine and epinephrin) preceded by ⅙ gr. morphine and 1/200 gr. scopolomin for adults. Ether skillfully administered is best for children. It has been my observation that the healing of operative wounds of patients whose diabetes was well under control has been normal. Further we believe that an acute middle ear complication, for instance, will respond to treatment as well as in the absence of diabetes; however, in the presence of disease of the masteroid operate without delay in order to prevent the deleterious effect of the infection on the diabetes. The most important question to consider is whether or not the patient's diabetes will be favorably influenced by operation considered from two standpoints: (1) With reference to the immediate post-operative manifestations of local and systemic conditions. (2) With reference to the ultimate benefit accruing from the removal of a definite focus of infection. Our experience and that of others has taught that the presence of controlled diabetes does not retard the healing of operative wounds. On the other hand, underlying diabetes is not improved. Retardation of the disease in acute cases is the most that may be expected. If a patient is having frequent attacks of tonsillitis and if each attack decreases his tolerance the removal of the tonsils seems to stop this decrease. Whether or not chronic tonsillitis affects diabetes unfavorably is difficult to say. The removal does not improve the patient's tolerance; however, many of them do become acutely inflamed and definitely detrimental later, hence their removal is recommended.

Summary: Careful attention given to pre-operative and post-operative.

Care of diabetic patients.

Slight glucosuria during post-operative period disregarded but no effort spared to combat acetonia.

Local anesthesia preferred for adult diabetic patients. Ether for young patients.

Delay of healing not observed following local anesthesia.

Dr. C. P. Gray (Monroe): Mr. Chairman, I am convinced that practically every major surgical procedure is feasible with the proper use of insulin. You notice I said "with the proper use of insulin." I don't believe that the statement is true if the use of insulin is haphazard. Just because you have got a hypodermic with insulin in it doesn't follow that you can do anything in major surgery. I feel so keenly about this that where a large surgical problem presents itself for operation in the presence of diabetes, I insist on taking up the case jointly with a medical man.

For instance, in the case referred to by Dr. Lemann (which by the way is a striking example of what can be done with proper medical direction in conjunction with surgery) there was a definite understanding that the man wouldn't be touched until permission was gotten to utilize the medical man. As a matter of fact, the medical man did start his work before we did ours. So a close supervision of the medical phase makes for results, makes for the comfort of the patient and for the comfort of the surgeon.

*A. Wilder, R. M.: J. A. M. A. 78: 1878-1884 (June 17) 1922.

In the case referred to, you have the worst possible type to deal with in surgery. You have a desperately ill individual with a diffuse peritonitis and with sepsis, and you know your vicious circle—sepsis making the diabetes worse and the diabetes making the sepsis worse, and yet this individual's recovery was simply wonderful. The surgical post-operative phase throughout, from the operative side and post-operatively, was practically the same as in any other case, but the diabetic phase was controlled all the time even to the extent of having examinations made as often as every hour at the beginning so that the individual was thoroughly comfortable.

When we saw that his work was dropping off, that was controlled. When his toes began to slough, that was controlled, and everything else that came up in conjunction with the diabetes was controlled just as though the patient didn't have any diabetes at all.

But the point that I want to lay stress on is that the medical phase is important throughout. Another important point in the handling of these diabetics in conjunction with major surgery, in my opinion, is the use of the anesthetic. Undoubtedly ethylene has a definite value. Certainly your chances for acidosis with ether are greater, and on the other hand they are diminished with ethylene. In the case referred to, ethylene was resorted to at first and the two subsequent procedures were done with local, but the avoidance of ether is certainly of distinct benefit. (Applause.)

Dr. A. A. Herold (Shreveport): Since the advent of insulin I have had occasion to see several cases that went to the surgeon—"surgical diabetes"—either surgical from complications of diabetes or from some foreign condition arising, like acute appendicitis, etc., and the operative mortality has been nil. There happens to be one pitfall that a man may get into if he is not careful. Dr. Tilly almost stepped into it, but he did refer to blood sugar; for example: We had a case brought in with a crushed foot and leg. It needed immediate amputation. Routine urinalysis was not made until after the operation. It showed two per cent of sugar. The second specimen obtained showed two per cent. of sugar with acetone,—acetone, I presume, due to ether anesthesia. I was asked if it wouldn't be wise on account of the fact that he had been operated on to give that man insulin. I said, "No, let's get a blood sugar." The blood sugar was normal. We took repeated blood sugar readings and every one was normal. There was a man who, if given insulin, would have been more harmed than helped. I just mention that because that is an error anyone is liable to fall into, especially in traumatic cases.

Dr. Lemann: (in closing read a brief summary of his paper): If any one of these points is disregarded, you cannot hope for the success as indicated by the constantly growing statistics of surgery in diabetes. The subject is an exceedingly encouraging one. As I tried to point out, if we handle these cases properly, there is no reason we should have a diabetic death after an operation. I won't say we should not have deaths after operation because you have deaths after operation in non-diabetics, but there is no reason why you should have a diabetic death after operation; namely, a death from coma or from inanition. It has grown now so that it ought to be almost a disgrace, I was about to say, to lose a case in coma after an operation if you have known of the existence of the diabetes before the operation.

SOME PROBLEMS IN GYNECOLOGY.*

B. C. GARRETT, M. D.,

SHREVEPORT, LA.

The surgical world is still perplexed as to the best method of dealing with carcinoma of the cervix, which is twenty times as common as cancer of the fundus. The progress made thus far is by no means comparable to the effort expended since the recovery is still less than fifty percent in carefully selected cases after radical operation, and there are still ten thousand women dying annually of this dreaded disease. The radical operation gives the largest percentage of cures but is attended by the highest primary death rate and is followed by serious post-operative complications which are difficult to cure and which make life a burden. These facts must be borne in mind in any attempt to judge its value.

In the final analysis the chief problem to solve in the treatment of carcinoma of the cervix is the proper estimation of the the amount of involvement of the growth. However, it is agreed by practically all operators that cases showing involvement of the glands, the bladder or the rectum,

*Read before the Louisiana State Medical Society meeting, Monroe, April 15-17, 1926.

and those in which the uterus is fixed by involvement of the parametrium, are inoperable; on the other hand if the uterus is moveable and the bladder, rectum and glands are not involved the case is considered operable.

Likewise, it is difficult to estimate the results of radical operations as one operator might term a case early which another operator terms late, and vice-versa. The primary mortality rate, as taken from a number of surgeons both American and European, ranges from twenty to twenty-five percent as the minimum, and the absolute cure seventeen and one-tenth percent.

Few discoveries have been made in gynecology that have so revolutionized the treatment of carcinoma as have X-ray and radium. Zweiful reports five hundred cases with a cure of thirteen and eight-tenths percent over a five-year period. With their use, these inoperable cases are often made comfortable for a period ranging from one to five years. Clark states that radiation, applying one hundred miligrams one to three times, is of great benefit to inoperable cases, otherwise doomed. Radiation is not the ideal remedy but it compares favorably in results with the radical operation. And in spite of the fact that radium and X-ray have been expected to accomplish too much in some cases, their use is still one of the great advances of the age. G. E. Spahler, of Philadelphia, claims that twenty-nine per cent of all cases he has treated by radiation were cured. He says his success compares favorably with Heyman who reports forty percent cure over a five-year period of early and borderline cases.

Greenough, chairman of a committee appointed by the American College of Surgeons, made the following report on eight hundred twenty-nine cases of carcinoma of the cervix: Ninety-four were free from disease three years after treatment; one-half of these were treated by X-ray and radium. There were no cures of those treated by cautery alone. In two hundred forty-three early and borderline cases hysterectomy cured one in three with an attending mortality of one in five. Radium together with palliative treatment (cautery) cured one in three, and radium alone one in five.

The Rockefeller Institute has shown experimentally that pre-operative radiation is indicated, first, because it devitalizes the malignant cells so that they are not easily transplanted; second, that when tissue has been irradiated it does not easily become infected with cancer cells when implanted but rather has a destructive effect on them.

Post-operative radiation has been used quite extensively, and sometimes it has been thought to destroy cancer cells and it most certainly does retard their growth, but in deep-seated cases the cancer appears in some other parts of the body and the patient dies of cancer anyway.

Bowing of the Mayo Clinic states that he uses the following method of treatment of carcinoma of the cervix. First, he gives pre-operative radiation and then advises hysterectomy in early cases. This furnishes an opportunity to view the pelvic pathology and examine for cancer of the ovaries, as sometimes occurs. The most favorable time to operate is from four to six weeks after treatment, as usually by this time, the parts are healed and the danger of infection of transplanting the cells are lessened. If the delay is too great before operating, the operation will likely be more tedious from fibrous tissue, especially if the quantity of radium has been excessive.

Heyman claims twenty and nine-tenths percent of cures over a five-year period from radium treatment in all types of cases and forty and five-tenths percent cures in early and borderline cases. He thinks the results are as good as those obtained by surgery and also that radium has the advantage in that it relieves some cases which are inoperable. His method is

to give treatments at weekly intervals until three are given, and if there is recurrence locally he advises a hysterectomy. He has discarded the combined use of radium and X-ray as he has found that the results with radium alone are better.

From the above discussion it must be readily admitted that we are far from a satisfactory manner of handling cases of carcinoma of the cervix. But it is our opinion that in view of our present knowledge, in early cases of carcinoma of the cervix, probably the safest method is to first give radium treatment and follow in a few weeks with hysterectomy. Late cases are best handled by radium treatment but the benefit derived is only of a temporary nature.

At the Charity Hospital, Shreveport, sixty-three cases have come under our observation during the past two years. These were all treated with deep X-ray except two as the Charity Hospital has no radium available for such cases. Two were treated by surgery. Letters were sent to each of these patients and there were twenty-nine replies. Eighteen had died, including the two upon which hysterectomy was done; five were worse; six were improved, two of whom had had further treatment elsewhere.

During this same time thirty-five cases came under our observation at the Schumpert Sanitarium. These cases were handled by various methods, and as yet the time is too short to tell what the ultimate results will be. Replies to inquiries sent out indicate that these patients are still doing fairly well.

We would like to mention another condition of the uterus appearng late in life after menopause, which is quite annoying. This condition consists of a constant, watery drip from the uterus. This discharge may or may not be bloody. No cancer of the cervix is found on examination but the walls of the uterus will probably appear thickened. If curettage is done cancer may or may not be found. The relief from curettage is only temporary. The question arises as to whether to do a hysterectomy on such cases or not. We think so, because radium apparently does not react well on a senile uterus nor does it relieve a submucous fibroid when present. Besides, radium is not as effective on the fundus of the uterus as on the cervix.

We recommend hysterectomy on all cases of cancer of the fundus. We recommend radium in small doses for menorrhagia, especially in young women, since often when menstruation returns it is normal, and the patient's chance of becoming pregnant is good. We have had some failures with radium in such cases. We have found that the tendency in young girls is for this condition to correct itself.

In the treatment of fibroids, radium should only be used in the intramural, symmetrical type, size of pregnancy of three or four months time, and near the menopause. It should not be used on young women whose ovarian function we wish to preserve. It is not good in P. I. D. complications but is probably the best treatment in menopause bleeding.

Many operators prefer to do a myomectomy where possible, especially in young women. It has been claimed that myectomy was more dangerous than hysterectomy, but this statement is evidently in error, because in nine hundred nine cases at the Mayo Clinic the death rate was only seven-tenths of one percent. The subsequent pregnancies in these cases bear out the importance of performing myectomy instead of hysterectomy. Recurrence does not occur as often as we once thought, for in the cases reported above statistics show that operation was necessary in only two and five-tenths percent and that at a much later date.

Some operators recommend that while doing myomectomies, if hemorrhage is

present, it is well to open up the uterus and explore so as to rule out carcinoma. Radium in well defined cases is of great service but cannot be compared to surgery.

Crile agrees with Clark that near, during or after menopause, cases of intramural fibroids, or cases of fibrous uterus with hemorrhage may be treated with radium plus deep X-ray, but if tumor is submucous or sub-peritoneal, the radiation will probably fail.

In fibroids of the uterus, surgery relieves practically one hundred percent of cases. The technique of operation has been so perfected that the death rate is very low, say one to two percent, and the patient is assured of the preservation of the ovarian tissue. The only question involved is whether the patient is a good surgical risk.

Bevans of Chicago, and Jasske point out that a retroflexed mobile uterus produces no characteristic symptoms and little or no distress. When there are symptoms associated with a retroflexed uterus complications of any of the organs of the lower abdomen may be expected. Therefore, retroflexion should be investigated very carefully before operation is done.

Ovarian transplantation has been revised and brought up to date by Martin. However, it is a serious question to my mind whether transplanting an ovary is ever justifiable, since after being transplanted they usually swell and give considerable trouble in their new surroundings.

It seems the consensus of opinion that hemografting and heterografting are failures because there seems to be antagonism between different individuals of the same species. Auto-transplantation is the best because it retards menopause which usually occurs after castration.

CONCLUSION.

First, deep X-ray treatment which apparently promised so much a couple of years ago, is evidently losing some of its favor, for now the majority of cases we thought it was curing are dying at a rapid rate.

Second, early cases of carcinoma of cervix are probably most successfully treated first by radiation, followed by hysterectomy; late cases by the use of radium alone.

Third, fibroids of uterus are probably best treated by hysterectomy because only the intramural type is amenable to radium, and it is often very difficult to distinguish this type from others.

DISCUSSION.

Dr. S. W. Boyce (Shreveport): The essayist has brought to our attention a reconsideration of the problems which confront us in dealing with the pathology arising in the organs of the female pelvis. From our repeated study of these problems they appear to us as the English alphabet, yet when we consider the percentage of our ultimate cures and failures of these pathological states, these problems appear as a great unscaled peak. There are many complicating factors which make the satisfactory handling of these conditions still one of our unsolved tasks, I feel that the larger part can be charged to the carelessness and lack of education on the part of the lay public. While a certain part may justly be charged to our own lack of systematic and uniform method of handling the definite clinical factors as we find it. When we come to consider carcinoma of the uterus and cervix we recall how a few years or months since when the lay press in its enthusiasm for news and things spectacular heralded X-ray and radium as the great heal-all to save humanity from the scourge of cancer. We allowed their enthusiasm and other considerations, probably more pecuniary, to sweep us into an unlimited use and recommendation of these remedies. I feel that our ardor has been dampened and we are now prepared to give these agents their proportionate place in our armamentorium for fighting malignant changes under consideration.

We now have surgery, X-ray and radium and the electric or thermo-cautery as our agents for attacking this problem. At first thought it would seem that a complete surgical removal of a malignancy would be the ideal in the treatment, but with this we must consider the primary mortality of 20%, on the other hand where we use X-ray and radium or the actual cautery, the primary

death rate is practically nil; this, too, would appear to be perfection itself, but here, too, we must admit that, for some reason thus far not clearly understood, some cases fail to respond satisfactorily, and the final death rate is still far above what we might hope to attain. It would be monotonous for me to discuss here the specific types of cases with this special treatment. So again we will revert to that twice-honored practice where each individual case is a problem unto itself, which must be solved by a happy combination of the inate surgical judgment coupled with a proper estimation of the values of our different methods of treatment and unbiased by our overzealous enthusiasm for any particular one of them.

And we are told that retroversion produces no symptoms, but to everyone of us upon whom devolves the responsibility of being the doctor for the entire family all the time, this is either the diagnosis or one of the symptoms in a complex which is the nightmare of our whole existence. Retroversion may be symptomless, but, like the stork, it is too often with the crows. It may be harmless but is too frequent in the neurotic undernourished mother who has had four or five babies in rapid succession and whose many aches and ills are the bane of the existence of her family doctor. She has general debility, retroversion, probably some endocrine dyscrasia, a dissatisfied disposition, etc., all of which are thrust upon the guardian of all the family ills and he is expected to deliver.

A round ligament suspension will cure some of these. It has done so often in my hands. I regret to admit that in desperation to relieve a complete invalidism, I have resorted to a removal of all organ above the cervix and effected a symptomless cure. We are told that retroversion is symptomless and surgery is to be avoided, and I frankly admit that any surgeon who indiscriminately operates this type of case takes his reputation in his own hands, and should he fail to relieve, is subject to an endless chain of bad advertising. But what are we to do? All the discussion and admonition is what not to do, and we are left in this dilemma. Retroversion is one part or is the foundation of a complex syndrome which is one of the greatest problems in the practice of medicine today.

THE BODY SURFACE AS A PROMISING FIELD FOR THE PREVENTION OF DISEASE.*

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Distinct progress in any particular field of scientific endeavor can usually date its origin to some outstanding discovery or scientific fact that opens the way to new achievements. Even so with the ever-forward step of the medical profession, in that every new remedial agent or surgical principle finds its application throughout the entire field of therapeutic uses, its real merit to stand or fall as it withstands the scrutiny of conscientious observers. The ever alert and progressive physician is constantly watching and endeavoring to bring to his field of daily activities every promising remedial agency, if by so doing he may advance a bit closer the ideal in the practice of medicine.

All have observed that of late years there have been incorporated within our armory, and it might be added, to stay, certain therapeutic measures in the form of actinic, electric, radio-active, sero-, glandular, and even other agents, making many new angles of approach to clinical entities heretofore largely evaded for lack of more dependable remedial procedures. In advance of former methods, conceptions of numerous toxic substances, largely individual in character, which have been the riddle of every type of practitioner, both with reference to etiology and cure, have become the object of constant study and investigation, with the result that much information is now available in meeting certain professional demands with many dermatoses, heretofore a closed door. Also an ever-widening field of interest and study is being directed to certain internal secretions with reference to their practical workings in health and disease, to the extent that the modern

*Read before the Mississippi State Medical Association, Jackson, May 11-13, 1926.

physician employs in his daily practice formulae applicable to diseases that affect, or result as a lack, of proper functioning of these important glands.

We might ask what these have to do with the prevention and relief of diseases that affect the body surface. Much indeed when the full significance of the body integument is estimated, since more or less recent researches have brought within the scope of modern medicine therapeutic measures heretofore unavailable for their proper supervision and successful eradication. This organ, the skin, has a manifold function. It stands as a barrier protecting the less defensive structures of the whole against infective processes, any part of which once diseased, may be repaired with difficulty. It acts also as a mirror, reflecting to the clinician pathology often hidden deep in the organic life of the individual and is also the deposit and unwelcome host for hundreds of affections, reflecting many disease entities, all of which must be individually diagnosed and treated. It should be remembered that the longer such pathology remains, the more seriously it impairs the body surface and the less resistant are nature's barriers in its defenses against subsequent attacks.

In the light of our present knowledge, let us look, if we may, a little deeper into certain conditions that suggest or offer relief, primarily and ultimately, to patients presenting cutaneous potentialities, bearing in mind of course that fundamental knowledge or diagnostic ability is indispensable, if we would interpret properly such body phenomena. In the case of the child, every physician knows that many infantile skin lesions are discovered, which if the causal factors are known and removed, give to the patient not only absence of the present illness, but less opportunity for future implantation of infectious agencies. Skin affections in infantile life should be regarded seriously. When the surgeon opens the tissues, every aseptic precaution is taken for safe-guarding the inroads of pathogenic processes due to exposure of vulnerable parts. Why not consider the result with relative seriousness in open dermatological cases, many of which lay bare the defenseless tissues to the invasion of the same dangers, with the addition that the exposure remains open for weeks and even months at times, absorbing such contaminations as may be lodged within its folds. Our caution is, therefore, that obviously the initial step in many mysterious future phenomena result from neglect of such conditions and play a large role in determining the health history of many individuals. To indicate more fully the purpose of this paper, it might be well to select a certain familiar disease and examine its untoward possibilities and evaluate the rewards resulting from their removal. All are familiar with infantile eczema, an acute or chronic inflammatory disease, and one of doubtless wide causal factors. The later modes of study aid us materially in its proper interpretation and relief. As to causal factors, every consideration is due the patient, including a study of all probable causes as a multiplicity of diseases may be evaded for a life-time thereby. In this particular condition the individual skin characteristics are first to be considered. Individuals vary widely. The blonde presents problems with the dermatologist not to be considered in the darker types. Other skin characteristics as indicated by the erythema pigmentosa type should be given critical interpretation. Forty-eight per cent of all eczema cases are from a parentage similarly diseased. Hence an accurate estimate of the skin as to texture and predisposing factors is most important, since the erroneous use of bathing and cleansing the skin with harmful agents may be the only etiological factor, the correction of which meets all therapeutic demands. Again bacterial infection is regarded as causal in many cases. The monococcus, the bottle-bacillus, and others are found in many cases. If such can be demonstrated

as causal, it should not escape the observation of the diagnostician. Others regard external irritation as the chief or only cause of infantile eczema, such irritation being either thermic, mechanical, or chemical, and if so, this knowledge will be of inestimable value to the patient in order that such agents may be removed. It is also probable that a deviation from the normal in the blood chemistry, known also as sensitization to foreign proteins, may be the offending substance. Since the patient may face a problem of a life-time, he is justly entitled to all the profession can offer in the prevention of his disease, the knowledge of the cause being the only answer. If an individual should be found to possess intolerance to certain toxic substances, it is the part of the physician to provide the patient with such knowledge that it may guide him in evading such hazards. It is as important, therefore, to know his intolerance to a list of foods, pollens, metals, chemicals, or drugs, as that he should know the result should he handle poison ivy, poison oak or quinine, if sensitive to these substances. While the physician may not be quite as exact in his knowledge of these findings, yet his best efforts will be amply rewarded.

In later life many similar conditions present themselves offering opportunities of removal by proper preventive measures. The erythemas, neurodermatoses, haemorrhageas, sebacceous, or glandular dysfunctions, urticaria, acne, furunculosis, eczematoid dermatitis, acute and chronic, etc., etc., all have causal factors, which, if known, may be removed and which will result in the subsequent control of a train of symptoms. These may have direct bearing in fact on certain essential skin functions. For example, seborrhoea is a condition of wide potentialities. The skin is a regulator of heat, respiration, absorption, and sense. Seborrhoea, either local or generalized, has the possibility of exerting a detrimental influence to the body welfare, which, if but removed early, will result beneficially to the individual. There are also many skin diseases that are of exceedingly chronic nature offering the most favorable responses to treatment in proportion to the date of treatment, the earlier, the better the results: psoriasis, for example. These lesions, when few in number, especially if still recurrent seasonally, may be removed without difficulty. However, with the old hardened cases much less may be promised even from our most approved methods of treatment.

But lastly, and possibly of greater importance is surface or epithelial growths, benign in character primarily, but having the possibility of malignant development. This list is a large one. It maybe an apparently insignificant fissure of the lip, pigmented or unpigmented mole, wart, keretotic or seborrhoeic deposits, scar, or any form of surface blemish, which may be permitted to remain, particularly if in such condition as to harbor a low grade of inflammation or constantly undergoing mechanical injury. These are the source, and in fact the only source, of surface malignancies. "No pre-existing abnormal deposit, no cancer," is a statement fortified with high authority. Every physician sees these abnormal deposits and growths daily on the face and body integument of his patients. The individual antagonizes them constantly by mechanical irritation in many cases, often for half a life-time, and yet hesitates to remove them. Why? The false notion of the public that to disturb them in any way results in cancer is the only answer given. The correction of this error is a problem for the medical profession. It is not justifiable conservatism to wait until these precancerous growths show sensation, pigmentation, or color changes. The elimination of surface cancer will never be solved until the laity is convinced that all superficial blemishes of every kind are cancerous potentialities, and that their duty is to regard them seriously until removed. The writer believes that cancer is the result of cell environment. At least this is a good working hypothesis. The normal body cell has no ability to depart from normal cell

growth as long as the cell environment is homogeneous. However, when in close proximity with cells of different character which are attempting to reproduce themselves by the appropriation of more or less interchangeable substances, a third or mixed type of cell life is formed, a fusion, so to speak, due to cell environment. The new growth partakes of the characteristics represented in the types of tissue growth from which they originate, and constitute, of course, a spurious type of cell growth corresponding identically with neither of the original types. This has been termed the malignant cell. If this is correct, then what is the answer to all surface cancer? Simply the removal of *all* epithelial deposits and the conversion of the remaining tissue structure to one form of cell life only. Many methods may be used to accomplish this purpose, each to be selected and used as the individual condition warrants. It may be said also that this is practically without danger—less danger than are so many mechanical abrasions of equal size inflicted elsewhere on the body surface. This presupposes that the physician has due knowledge and regard for tumor differentiation. In other words, any lesion until the malignant cell change has occurred, may be handled with as little impunity as any other structure, provided there does not remain in the tissues any surviving cell life of the tumor removed. Emphasis is placed on removing from the public mind the popular idea that removal of pre-cancerous growths results in immediate malignancy. This responsibility lies solely with the physician, and the sooner he assumes it, and discharges it, so soon will the mortality from surface cancer fall to the minimum.

It is a responsibility without question that the physician assume the role of health guidance with his clients. This is no less binding and obligatory than that of combating impending ills. All are apostles of better health and happiness. To warn them of any preventable health hazard, or to give counsel in matters where the return of present ills may be thwarted, is inherent in every professional service rendered. May this very dry paper, which merely hints at the magnitude of its importance, guide us more definitely in the consideration of body surface healthfulness, even if apparently momentous or trivial, immediate or remote.

DISCUSSION.

Dr. Ross E. Anderson (Jackson): You have just heard a very fine paper. It was written by one of Mississippi's ablest men. I have wondered the last few days just why I was called upon to open the discussion of this paper, since I myself am doing eye, ear, nose and throat work. I can only discuss it as it affects me in my work. In eye, ear, nose and throat work we have certain skin disorders about the inner and outer canthi of the eye, the eyelids, about the orifices of the ear and nose. We see old chronic sores, warts, moles, nevi, etc. These conditions, if allowed to remain untreated, may give rise to cancer. No one knows the cause of cancer. That is something that medicine will yet discover. Whatever the cause of cancer may be, I believe that long-continued, low grade irritation certainly has something to do with its etiology. These conditions such as warts, moles, chronic sores, by causing low grade irritation over a long period of time may have something to do with the cause of cancer. When I have to deal with a condition of this kind I try to remove it as early as possible lest it result in malignancy. I think this is quite the proper thing to do.

I enjoyed this paper. It covers in a sense every branch of medicine. Every branch of medicine has skin disorders, but I can only try to discuss it from my viewpoint.

Dr. D. W. Jones (Jackson): We appreciate Dr. Hall very much here. Hardly a week passes that I do not find occasion in my work with children to send a patient to Dr. Hall for diagnosis of some skin condition, giving me a line on the internal condition of the patient with reference to diet, etc.

I had a patient I sent over one day and Dr. Hall charged a pretty stiff fee. I saw the prescription he wrote and memorized it. Soon I had another case just like it, so I gave the same treatment, but it did not cure the patient and I had to take her to Dr. Hall. He gave another prescription, and I said to him, "See here, Dr. Hall, how is it that you give a different prescription? This case is exactly similar to the

other." He said, "No; this is a different type. The other was a brunette and this is a blonde."

Dr. W. A. Dearman (Long Beach): I do not know that I ever had such a harvest of urticaria as we have had this year. I have made, I do not know how many, protein tests in people that I thought were sensitized to certain proteins, but if I have gotten a satisfactory response to a skin test I have not been able to interpret it. We need the dermatologist. I do not know another man in the State of Mississippi who confines his practice chiefly to dermatology. It is a highly specialized branch of medicine.

The chronic skin disorders are very stubborn and Dr. Hall has brought out the underlying manifestations due to endocrine imbalance and to all kinds of toxic factors anywhere from cat hair to oatmeal. We need the dermatologist to give us the classification of the cutaneous disorders. Sometimes it is hard to diagnose scabies in a clean human being. I look after about 180 pretty college girls, and it is hard to account for scabies there, indeed, it is humiliating to make the diagnosis. I think it is time we had an occasional paper impressing upon us some of the more outstanding etiological manifestations, the clinical manifestations, and the diagnosis and treatment of skin disorders that come under our observation.

Dr. R. W. Hall (closing): I feel as though I have presented this subject in a rather unsatisfactory way. I want to make this statement—I do not do so critically—but in the cases I have seen I find the majority of them that have had treatment have been over-treated, not undertreated. The initial prescription written for a dermatological case is the most important. The evaluation of the type of skin must be considered. The physician must evaluate every item in the prescription, and it must be suited to the individual case. Otherwise, more harm than good is often done.

Sensitization was mentioned by Dr. Dearman. That covers a very wide field. Let me give you an illustration. A doctor in this city came to me recently and said, "Doctor, look at these rings around my wrists." He had some erythematous rings around both wrists. He said he had them every summer and they were getting deeper and he was worried about them. I knew it was some kind of sensitization problem, so I asked him where he had his laundry done, and then called up that laundryman and asked him how they treated cuffs that were done up in that laundry. He said that usually the perspiration is so hard to remove that they use a very strong alkali to remove it from the margin of the cuffs, although the rest of the garment does not get the same treatment. You can see what was the trouble. That strong alkali used to cleanse the border of the cuff had come in contact with the perspiration of the arm in summer and produced an irritation.

That is the key to the argument I am trying to bring. Catch these dermatological conditions early because it is the long delay that causes trouble. Hunt for the hidden things that are the cause of most of our chronic skin conditions.

A METHOD FOR THE ROUTINE EXAMINATION OF FECES FOR THE OVA OF PARASITIC WORMS AND ENCYSTED AMEBAS.*

F. M. JOHNS, M. D.,

NEW ORLEANS.

Amebic dysentery represents the acute form of ulcerative colitis caused by the growth and reproduction of the *endameba dysenteriae* in the sub-mucosal tissues of the colon and rectum. The clinical course of most infections is marked by spontaneous or induced remissions, during which time the bowel movements may be normal or lessened. It is also noteworthy that the disease is usually more severe in the dependent parts of the large bowel, and there seems to be a tendency for the ulcerations to localize in such dependent parts as the cecum or rectum, and the symptomatology of a given patient depends largely upon the size and localization of the infection. Diarrhea or frequent small bloody-mucoid stools are dependent largely upon infestation of the rectum, while if the disease is localized in the neighborhood of the cecum, the general symptoms are those of a chronic appendicitis, and the bowel move-

*Read before the La. State Medical Society Monroe, April 15-17, 1926.

†From the Laboratory of Clinical Medicine, Tulane University of Louisiana.

ments are not necessarily disturbed. The pathogenic ameba is now supposed to reproduce vegetatively only within the tissues of the host and it is not always possible to detect the presence of an infection by stool examination. If the lesions are in the rectum and lower sigmoid, the bloody mucus as passed directly from the patient or of material removed from the lesions by proctoscopy when examined for the actively motile vegetative amebas offers the best means of diagnosing their presence. (See Fig. 1.) If the lesions in the cecum or transverse colon allow of the escape of vegetative amebas from the lesion, these wander out into the liquid stool. As the fecal mass passes down the large bowel, becoming dehydrated and finally assuming the formed consistency, we find that the amebas have likewise decreased in size, lost motility, become oval or round in shape, elaborate a protective covering and we have the encysted type of ameba present in the stool. (See Figs. 2 to 6.) Encysted amebas are thus usually found only in formed or semi-formed stools and denote an infection high up in the large bowel.

The generally recommended methods employed in the search for the presence or absence of encysted amebas in such stools utilized a simple dilution of feces with water and an eosin-iodine stain to serve as contrast. These methods are open to several disadvantages, notable among which are: (1) Lack of concentration; (2) the necessity of using very thin dilutions on account of the cloudiness caused by enormous numbers of bacteria; (3) the penetration of the contrast stain into the cysts within a few minutes, thus rendering them more obscure; and (4) the necessity for a specialized examination.

By the use of the centrifuge on watery suspensions of the feces it was found that encysted amebas were sedimented in about one-third longer time than is required to throw down the ova of parasitic worms. The centrifuged preparations show the usual 8 to 10 time concentration of ova, 2 to 3 time concentration of cysts and by clearing the specimen of bacteria and other small particles renders the appearance of cysts much easier of identification with the low magnification of the microscope, thus combining the two examinations (Figs. 7 and 8). If cysts are present, the further identification of the type by means of the iodine staining of the nuclei is much easier of accomplishment in the washed and concentrated material.

Method—Formed or semi-solid stools are diluted from 10 to 15 times with water, shaken well and strained through two layers of cheesecloth directly into a 12x115 mm. (½x4 inch) *round bottom* tube. Balance tube in centrifuge. (This should be equipped with Cornell shields and should be able to run at least 1500 r.p.m.). Start centrifuge and immediately advance to full speed of 1500 r.p.m. Shut off power within 15 to 20 seconds after advancing the speed. Pour off the supernatant liquid, resuspend sediment with water and recentrifuge. (Another such washing will frequently clear the sediment still more.) Decant again, leaving a few drops of water to shake up the sediment with. Pour on slide and spread out to where all particles on the slide are easily visible under the low dry lens and examine as for parasite ova. The relative size of cysts as compared to the ova of *uncinaria americana* and *trichuris trichiura* are shown in Figs. 9 and 10.

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EXPLANATION OF PLATE.

Fig. 1. Vegetative forms of *endameba dysenteriae* as found in bloody-mucoid stool.

Fig. 2. Precystic amebas found in soft stools.

Figs. 3-4-5. One, two and four nucleated cysts of *endameba dysenteriae* from formed stools.

Fig. 6. Eight nucleated cysts of large non-pathogenic *endameba coli.*

(All of the above taken with the usual "high dry" magnification.)

Fig. 7. Low dry field of plain diluted feces showing several cysts.

Fig. 8. Low dry field of same specimen after centrifuge concentration of cysts.

Figs. 9-10. Low and high dry magnification of amebic cysts and ova of hookworm and whipworm.

DISCUSSION.

Dr. D. N. Silverman (New Orleans): Heretofore we have been accustomed to routine examination of the solid part of the stool for the cysts of ameba, but I think the additional technic of Dr. Johns will have twofold benefit. One is that with the routine examination as is the custom for ova, we shall also be enabled at the same time to look for the cysts of ameba. The other is, of course, with the opportunity of examining more frequently in that way for the cyst, the making of diagnosis more often.

The importance of examining stools for the cysts of ameba, etc., cannot be stressed too forcibly. Cases of the metastasis of the endameba from the bowel to various organs of the body are not accompanied by a history of dysentery in some fifty per cent of the cases. The places of metastasis of ameba have been in the brain, the liver, and often found in the epidermis and testes. I want to say that the recovery of the cysts from the stool will very often make a diagnosis of a condition such as hepatitis, abscess of the liver, whereas no definite information other than the finding of these cysts can be had.

I want to say a word in defense of the surgeon, however, in removing some of the gall bladders, especially those that are affected, in cases of ameba dysentery. In amebic dysentery, like other forms of colitis, there is a free disposition on the part of the biliary tract to infection and I have seen gall bladders that were chronically infected removed and it proved to be chronic infection. These gall bladders were not unnecessarily removed in such instances, although the present disposing factor was amebiasis.

INFANT MORTALITY FOR 1925.

The report of infant mortality for 1925 published by the American Child Health Association is compiled from figures applying to 632 of the 641 cities in the birth registration area, and from records of sixty-five of the seventy-five cities in the death registration area only. The infant mortality rate is the number of deaths under one year of age per thousand births, exclusive of stillbirths. In 1924 the infant mortality rate for cities in the birth registration area was 72.2, the lowest on record; for 1925, the figure was 72.6. Stonington, Conn., and Winona, Minn., presented the lowest village infant mortality on record, with rates of 32. In 1920 these two communities had populations less than 25,000. New York, where the infant mortality was 64, had the lowest rate among the ten largest cities of the country. Although this is double the proportion of deaths found in the small communities of Stonington and Winona, as a group the larger cities have lower rates than those of small size. For more than four years, Seattle has maintained the lowest rate for cities in the birth registration area, which in 1920 had a population of at least 250,000. The infant mortality in Seattle in 1925 was 45. In the death registration area, the lowest infant mortality rate, 57, was attained by Boise City, Idaho. These are crude rates, to be sure, and crude rates are somewhat unjust, since they do not take into account such influences as economic status, climate, race and nativity stock. In Southern cities, for instance, infant mortality rates are greatly increased by the relatively large number of infant deaths among the negroes. Within individual communities, nevertheless, the trend of the infant mortality rate is a valuable index of the efficacy of local measures. Corrected rates, with their wider significance, will be available as soon as all communities secure reasonably accrate registration of births and deaths. With this in view, the American Child Health Association "strongly supports the government's efforts to have the entire country within the birth registration area by 1930, for it feels that a complete record of births and deaths is essential for the carrying out of an affective child health program."—*Jour A. M. A.*, Aug. 14, 1926.

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A NEW ORLEANS PHYSICIAN.

In 1883, George W. Cable published a story entitled *Dr. Sevier,* the setting of which was the New Orleans of 1856, the town he knew and loved the best. Like a kindly and omnipresent godfather, the physician whom he created as the leading character in the dramatic narrative of the South, pervades the tale prominently with his benevolent and humane considerations.

The office in which he "waged war against malady" was located on Carondelet Street, where the Stock Exchange thrived, and where men congregated who "could best afford to pay for being sick, and least desired to die." Conveniently situated nearby was the great Charity Hospital of St. Charles, where the doctor "filled the chair set apart to the holy ailments of maternity."

Not a saintly physician enshrined upon a pedestal, he nevertheless "stood up straight in his austere pure-mindedness, tall, slender, pale, sharp of voice, keen of glance, stern in judgment, aggressive in debate, and fixedly untender, except—but always except—in the sick chamber." He was, apparently, beloved by all, and highly respected; a genuine aid in distress and suffering, but withal, paradoxically, a strictly practical practitioner.

Throughout the book, as Dr. Sevier is visualized in his various professional moments, a striking portrait is presented of his personality and character. As the story opens, he is seen at the bedside of an ailing woman, where, as the author shrewdly declares, the healer often finds himself "the tardy attendant of offended nature." During a devastating epidemic of a pestilence, perhaps the yellow fever, he is sketched as the forward-looking and sane hygienist. In his office, and on the street, he is revealed as the true friend and confidant of man. And as he sojourns through the wards of his hospital, he becomes the stern, yet inspiring instructor of the young students of medicine.

Lest any opprobrium or disrepute be cast upon the Charity Hospital, an institution which was famed as far as the city itself, the author took deliberate pains to assert that it was far from being a "plague-house." And, as he added:

"How good or necessary such modern innovations as 'ridge ventilation,' 'movable bases', the 'pavilion plan', 'trained nurses', etc., may be, let the Auxiliary Sanitary Association say. There it stands as of old, innocent of all sins that may be involved in any of these changes, rising story over story, up and up: here a ward for poisonous fevers, and there a ward for acute surgical cases: here a story full of simple ail-

ments, and there a ward specially set aside for women."

It was along the "long sanded aisles" of this latter ward that Dr. Sevier could be heard discussing with his students affairs of current interest, in addition to the details of his cases. And as public matters always aroused him, he would frequently give vent to his opinions of the horrible conditions existing in New Orleans, where, he observed, "malaria is king," and "beckons in consumption."

The interesting circumstances unfolded by the novelist are decidedly enhanced by his sincere delineation of this southern physician, whose role in life no less than in fiction is thus aptly summarized:

"A physician's way through the world is paved with these broken bits of other's lives, of all colors and all degrees of beauty. In his reminiscences, when he can do no better, he gathers them up, and turning them over and over in the darkened chamber of his retrospection, he sees patterns of delight lit up by the softened rays of bygone times."

How well Dr. Sevier garnered the fragments that were cast into his path has been tellingly described by the masterful pen of George W. Cable.

FACTIONS AND MEDICAL SOCIETIES.

The election of officers of a medical society logically and obviously brings about a division of the membership into two or more groups. It is but right and proper that scientific achievement and service to the organization be rewarded by the bestowal of a position of honor. It is but natural that there be difference of opinion as to the abilities and as to the deserts of the candidates.

But there is a tendency to argue that because the president of a state medical society lived in one part of the state that his successor should be chosen from among those living in another section of the state. Manifestly the geography of the state has nothing to do with the professional and scientific ability of a physician. It is equally obvious that he may render efficient and untiring service to the organization regardless of the point of the compass from which he hails. Sectionalism and factionalism favor the choosing of men of lesser ability. If we are to see our societies grow in breadth and in service to the public let us get rid of factionalism.

METHODISTS PLAN HOSPITAL.

Dr. C. C. Jarrell, secretary of the Methodist general hospital board, with headquarters in Atlanta, recently spent several days in New Orleans conferring with a committee in order that plans might be formulated for the locating of a Methodist hospital here.

The general conference has named New Orleans as a suitable site for a great general hospital to represent the Southern Methodist church and promises its support of such an enterprise. Dr. Jarrell declares that the commercial importance of New Orleans and its honored and famed medical talent makes it a strategic place for such an institution. It is indicated that there is no question about this hospital being erected if the city and state will give the proper support.

It is proposed to build the hospital in units, the first of which would contain 100 to 150 beds. Later other units of similar size would be added. Such an institution should be welcomed by the profession and we trust the Louisiana conference, which meets in November, will take favorable action in this regard.

INSPECTED OYSTERS.

Cleanliness and safety of food supplies are matters of constant interest and importance, particularly so in the case of foods which are commonly eaten raw, or cooked in a way which may not sterilize.

Oysters are an example of such a food and with the coming of the "R" months, a review of what is being done to ensure the safety of the oyster supply seems pertinent.

Frequent inspections are made by the Louisiana State Board of Health to ensure sanitation of the oyster beds, the safety of the water in which they are grown and general conditions of the plants. The work is done by means of a special laboratory boat built for the purpose.

Shucking and packing plants are required to be screened, to have well drained concrete floors, adequate supplies of clean cold water and of hot water for cleaning and sterilizing utensils, and proper lavatory and toilet facilities; employees must have certificates of medical inspection.

Containers in which oysters are packed and shipped are required to be marked with the identification mark of packer.

Oyster boats are required to be kept clean and tight to avoid contamination by bilge water.

The State Board of Health issues from time to time lists of approved plants. The consumer can assist in securing protection for himself by seeing that his dealer handles only oysters from approved plants.

CORRESPONDENCE.

To the Editor:

In September, 1925, a young girl in my employ had her tonsils removed by one of our most prominent otologists, and in the operating room of one of our leading hospitals.

Whereas, up to the moment of her taking the anesthesia (ether), she had never appreciated the fact that she had ears—that is, as far as having them give her any trouble was concerned—the moment she regained consciousness after this operation, her ears ached, and the pain continued.

Days and weeks passed, and notwithstanding the fact that her physician told her that there was absolutely nothing the matter with her ears, *they hurt her all the same*, at times, and quite frequently.

One day she reported this fact to me. That the pain was getting worse, and the paroxysms more frequent, and that *her doctor wasn't doing anything more for her.*

Of course, this did not sound good to me. A patient suffering and nothing being done to relieve her, so I decided to send her to another otologist.

Now, of course, in a big town like this, there is no one specialist who is better than all the rest, but if I were to ask you to name three of the specialists who rank the highest in this city, I am sure that the name of the one to whom I sent her would be among these three.

Now he was "busy", so his perfectly competent assistant undertook her case and *treated her for two weeks.* At the end of this time he had not found the cause of her trouble, his *treatment* had produced no results, and as he could find nothing the matter with her ears, he told her that she imagined that they hurt her (consoling, was it not?).

By this time, there were periods during which she became almost frantic. She had been in my employ for three years, and I had always found her a pretty good worker, and always on the job. So when two more weeks passed and the pain grew worse, I sent her back to my friend and asked *him* to take her in charge, himself, as his assistant could give her no relief, and I stressed the point that she must get relief at any cost. She just couldn't keep on in this way.

Upon examining the ears he said they were normal. He *treated* her for two weeks during which time she was unable to work, the pain was so severe. At the end of these two weeks he said she must be suffering from some focus of infection, and suggested that she have her head x-rayed. She went to one of our leading Roengenologists

who X-rayed her head and found that the right antrum did not look clear. This was opened into and declared to be all right—no pus being found. Pain continued.

Next I sent her to one of our leading internists who "looked her over"—nothing doing. Perfectly good condition—but she was suffering all the same.

Next our otologist suggested that she have her eyes examined, so she went to one of our very best men, and he reported that her glasses were correct. Pain continued.

Again, my friend suggested a focus of infection. Well as there was no one else to send her to, she had "been the rounds," I called him up and said, "You think that Miss Irma's trouble can be caused by infection?" "Yes, I do." "Well she has one doubtful tooth, and as she is in a very bad way—suffering right along—I'll take this out, but I'll tell you in advance, I don't think it will help."

Something had to be done. One after another, of these specialists had seen her and either had refused to do anything for her or said there was nothing the matter with her, so it really was up to me.

I said, "Suffering as you are, and no one being able to do anything to relieve you, I think we should take a chance on that doubtful tooth," and she would have had all of her teeth removed, if that would have given her relief, because she certainly was in a bad way.

Well, I extracted the tooth and it proved to be just one more tooth offered up upon the altar of ignorance. I declare, I did not know what to do for her. I was at the "end of the rope." Then I thought of Dr. Matas—my good friend, Matas.

I went to him and related the history of the girl. Was he interested? He surely was. Let her come to see him at once.

She went. He went over her case carefully. He gave her a prescription, and he told her what to do. He certainly did give her *intensive treatment* all right.

Will miracles never cease? Would you believe it? In a week she was much better. She continued to improve rapidly, and was soon free from all pain. At this writing she has not known for over three months that she has ears.

Now here's what I'd like to know. Having gone for several months to all of these best specialists in town, who could do absolutely nothing for her, and just told her that her pain was imaginary, howinel could Dr. Matas—*a mere surgeon*—recognize the cause of the *ear trouble* and cure her right away, the very first dash out of the box? Rather *uncanny*, was it not? Can some one explain?

C. EDMUND KELLS.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

LAFOURCHE VALLEY MEDICAL SOCIETY.

The Lafourche Valley Medical Society was entertained by the medical profession of Donaldsonville on Aug. 11, 1926. The scientific and business meeting was held in the Elks' Home. Papers were read by Dr. J. Boulet, on "Ectopic Pregnancy," and Dr. H. A. Folse on "Amebic Dysentery." These papers were excellent and were thoroughly discussed. After the business meeting, the members retired to Hotel Donaldson, where a sumptious banquet was enjoyed. The next meeting of the Society will be held in Lockport.

THIRD DISTRICT MEDICAL SOCIETY.

The Third District Medical Society was entertained by the medical fraternity of Abbeville, on Wednesday, July 28, 1926. The attendance was large and the gathering enthusiastic. Scientific Program: "Case Reports," Dr. L. B. Crawford, Patterson; "The General Practitioner and the X-Ray," Dr. G. C. McKinney, Lake Charles. Discussions were general and thorough. Abbeville distinguished itself forever in the minds of those who enjoyed the wonderful banquet that was given in the W. O. W. Hall. The menu was a "chef d'oeuvre."

BULLETIN
TUBERCULOSIS AND PUBLIC HEALTH ASSOCIATION OF LOUISIANA.

The fifth conference of the International Union Against Tuberculosis will be held in Washington, D. C., from September 30th to October 2nd, 1926, preceding the twenty-second annual meeting of the National Tuberculosis Association, which will be held from October 4th to 7th.

Headquarters for the annual meeting have been fixed at the Mayflower—Washington's newest hotel. Reservations should be made well in advance of the meeting.

It is anticipated that in quality of material to be presented this international meeting of the National Tuberculosis Association will excel any similar gathering since the International Congress on Tuberculosis of 1908.

Listed among the speakers are such world-wide medical authorities as Rabinowitsch-Kemper of Germany, Rist of Paris, Bernard of Paris, Ascoli of Italy, Archibald of Canada, and many others.

The sessions of the National Tuberculosis Association are open to all persons interested. The sessions of the International Union Against Tuberculosis are open only to members. Dues for membership in the International Union are $2.00 for the year 1926 and in addition $5.00 for membership in the National Association. Check should be made to the order of H. B. Platt, treasurer, National Tuberculosis Association, 370 Seventh Avenue, New York City.

The railroads offer quite attractive rates for a thirty-day round trip ticket, and ample hotel accommodations can easily be arranged by communicating with any of the several hotels in Washington.

The Tuberculosis & Public Health Association of Louisiana has a representative director, Dr. C. V. Unsworth, who is entitled to attend the meetings of the board of directors of the National Tuberculosis Association, and our association has been further honored by the appointment of its president, Dr. W. H. Seemann, to serve as a member of the reception committee to the members of the International Union.

We hope that a good attendance will be had from among our Louisiana workers.

For full particulars regarding the meetings, and for hotel rates, you are urged to communicate at once with the National Tuberculosis Association, 370 Seventh Avenue, New York City. This office will be glad to furnish any information available from this end.

DR. HELEN HINTON.

It is with regret that we learn of the death of Dr. Helen Hinton of Shreveport, on August sixth. Dr. Hinton was a native of Lumberton, Mississippi. She graduated from Newcomb College in 1908, and from Tulane medical school in 1922. She served her interneship at the Woman's Medical College Hospital, in Philadelphia, 1922-24, after which she was Resident Physician in the Beebe Hospital, Lewes, Delaware, 1924-25. She came South in the Spring of 1925, and located in Shreveport, where she was engaged in general practice. Dr. Hinton was a member of the Stars and Bars, and the Alpha Omega Alpha Fraternity, as well as the Shreveport Medical Society and the Louisiana State Medical Society. She died at the age of 38, in Touro Infirmary, New Orleans, after several weeks' illness, and was buried at Macomb, Miss.

Dr. H. R. Unsworth has accepted an appointment in the Neuro-Psychiatric Division of the St. Elizabeth's Hospital, under Dr. W. A. White, where he will devote his special studies for one year to Neuro-Psychiatry.

"ALMA MATER HOME COMING."

The Ensworth-Central Medical College Alumni Invitation to Meet in St. Joseph

Dr. Charles Geiger, President of the Alumni Association, has extended to us a cordial invitation to hold the second annual meeting and banquet in St. Joseph, at the St. Francis Hotel, as his guests. The invitation is a "blanket" one and includes all graduates of the Ensworth-Central and Northwestern Colleges, as well as the professors. An entertaining program is being arranged, including Dr. Geiger's moving picture lecture, illustrating his recent world cruise and report on clinics in the Far East. The meeting will be held on Wednesday evening, October 13th, during the Kansas City Fall Clinical Week. The Interurban Line between Kansas City and St. Joseph affords hourly service. There is also an excellent concrete highway the entire distance. Wednesday evening is to be entirely devoted to alumni dinners at the Kansas City Clinics, so our members will miss no part of the program by attending the banquet in St. Joseph. Make your reservations today. If you know of any graduates practicing in your county, please add their names.

CHARLES WOOD FASSETT, M. D., Secretary,
115 East 31st St., Kansas City, Mo.

THE MEDICAL SOCIETY OF THE MISSOURI VALLEY WILL DEDICATE THE NEW MEDICAL ARTS BUILDING.

An interesting feature of the annual meeting of the Medical Society of the Mississippi Valley, September 15, 16 and 17, will be the dedication of the new eighteen-story Medical Arts Building in Omaha. All of the lectures and diagnostic clinics will be held in the auditorium of this building. An elaborate commercial exhibit will be located on the same floor.

On Thursday morning the members will be transported in automobiles to Council Bluffs, the birthplace of the society, where clinics will be held. Among those who will take part in the program and hold clinics are:

Dr. Hilding Berglund, Professor of Internal Medicine, University of Minnesota, Minneapolis, Minn.

Dr. Irving S. Cutter, Dean of Northwestern University College of Medicine, Chicago, Ill.

Dr. McKim Marriott, Professor of Pediatrics of Washington University, St. Louis, Mo.

Dr. E. C. Rosenow, University of Minnesota, Mayo Foundation, Rochester, Minn.

Dr. Gabriel Tucker, Bronchoscopic Clinic, University Hospital, Philadelphia, Pa.

Dr. R. L. Haden, Professor of Experimental Medicine, University of Kansas, Kansas City, Mo.

Dr. E. H. Skinner, Kansas City, Mo., will give a demonstration of Gall Bladder Visualization.

Dr. William Pusey, Chicago, Ill.

Dr. C. R. Moore, University of Chicago, Chicago, Ill.

Dr. Jabez N. Jackson, President-elect, American Medical Association, Kansas City, Mo.

Hotel Fontenelle will be headquarters. Program will be issued September 1st.

A. D. DUNN, President, Omaha, Nebraska.

CHARLES WOOD FASSETT, M. D., Secretary,
Kansas City, Mo.

DR. PUSEY TO GIVE FACTS AND VIEWS ON MEDICINE AS CAREER.

Writes Chapter for Edward L. Bernays' New Book, Contributed to by Leaders in Professions and Industries.

Dr. William Allen Pusey, past president of the American Medical Association, will contribute a chapter on the medical profession to a book on careers which is being brought together by Edward L. Bernays, well known public relations counsel, and which will be published shortly by George H. Doran Company. Mr. Bernays will contribute the chapter on public relations.

Dr. Pusey will outline the scope and function of, the specific ideals, the essential qualities necessary, the concrete methods of securing education and training, and the honorary or monetary goals in the profession of medicine.

Among those who have contributed chapters to the book are: John Hays Hammond, on engineering; Colonel Michael Friendsam, on retail merchandising; Charles Cheney, on textile manufacture; Harvey Wiley Corbett, ex-president of the Architectural League on architecture; Mary Roberts Rinehart, on writing; Jesse Lasky, on motion pictures; Homer Folks, on social service;

David Belasco, on drama; Pitts Sanborn, on music; Pierre Cartier, on jewelry craft; Joseph P. Day, on real estate; George H. Doran, on publishing; Stanley Resor, president of J. Walter Thompson Company, on advertising; A. C. Ernst, of Ernst and Ernst, on accounting; P. H. Markham, president of the Illinois Central Railroad, on transportation; Ray Long, vice-president and editor-in-chief of the International Magizine Company, on editing; Nelson Antrim Crawford, of the U. S. Department of Agriculture, on agriculture; Butler Wright, Assistant Secretary of State, on foreign service; Frederick James Gregg, on the arts; R. R. Deupree, general sales manager of the Proctor and Gamble Company, on salesmanship; Roy Howard, of the Scripps-Howard Newspapers, on journalism, and others.

ELECTED PRESIDENT.

The American Pharmaceutical Manufacturers' Association at its annual June meeting at Lake Placid, New York, did itself the honor to elect Ralph R. Patch president. Mr. Patch is the president and general manager of the E.L. Patch Co., of Boston, Mass., the well-known manufacturers of Patch's flavored cod liver oil.

The American Pharmaceutical Manufacturers' Association comprises the large manufacturers of preparations so extensively used by the medical profession; and physicians are therefore interested in the personality of its officers. Mr. Patch has served the association for several years as its secretary-treasurer, and his election as president came a a fitting reward for his years of service in behalf of that organization.

UNITED STATES CIVIL SERVICE EXAMINATION.

The United States Civil Service Commission announces the following open competitive examination:

Social Worker (Psychiatric)

Application for social worker (psychiatrics) must be one file at Washington, D. C., not later than September 21. The examination is to fill vacancies in the Veterans' Bureau, and in positions requiring similar qualifications throughout the United States.

The entrance salary is $1,860 a year. After the probational period of six months required by the civil service act and rules advancement in pay may be made wihout change in assignment, up to $2,400 a year. Promotion to higher grades may be made in accordance with the civil service rules as vacancies occur.

The duties are to investigate history and environmental conditions of patients; to analyze and submit data to the physician to aid him in arriving at a definite diagnosis and in outlining a course of treatment; to consider, report upon, and treat the social environment to which a convalescent patient may go or be expected to go.

Competitors will be rated on their education, training, and experience; and a thesis or publications to be submitted with the application.

NOTICE OF EXAMINATION FOR ENTRANCE INTO THE REGULAR CORPS OF THE U. S. PUBLIC HEALTH SERVICE.

Examination of candidates for entrance into the Regular Corps of the U. S. Public Health Service will be held at the following places on the dates specified:

At	Washington, D. C.	Oct. 4, 1926
"	Chicago, Ill.	Oct. 4, 1926
"	New Orleans, La.	Oct. 4, 1926
"	San Francisco, Cal.	Oct. 4, 1926

Candidates must be not less than twenty-three nor more than thirty-two years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily, oral, written, and clinical tests before a board of medical officers and undergo a physical examination.

Successful candidates will be recommended for appointment by the President, with the advice and consent of the Senate.

Requests for information or permission to take this examination should be addressed to the Surgeon-General, U. S. Public Health Service, Washington, D. C.

H. S. CUMMING, Surgeon-General.

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

J. S. Ullman, M. D., Associae Editor.

Dr. A. G. Payne, Greenville, is visiting the Mayo Clinic in Rochester, Minn.

Dr. T. E. Ross, President of the State Medical Association, was present at the July meeting of the Central Medical Society, Jackson, July 20, and the following program was given:

1. "Pellagra," Dr. J. S. Black, Jackson.

2. "Disabilities of the Hip-joint," Dr. Frank Hahaman, Jackson.

3. A Paper—Dr. C. R. Stingily, Jackson.

The Central Medical Society will probably omit the August meeting because of the number of their members taking their vacation.

The DeSoto Medical Society will hold a public meeting with the Parent-Teachers' Association of Hernando on the night of September 6, 1926.

Dr. L. L. Minor will read a paper on "The Necessity of Physical Examination at Stated Periods." There is to be an address by Hon. Clark Holmes. Dr. Hardie Hays of Jackson will speak on "The Health Officer and His Worth to the State of Mississippi." The Parent-Teachers' Association will furnish musical numbers.

Dr. W. H. Scudder of Mayersville having just completed his term as chief surgeon of the Army of Tennessee, S. C. V., has been promoted to surgeon-in-chief of the general organization of Sons of Confederate Veterans for 1926-27.

The State President reports having visited the Central Medical Society which met in Jackson on the 20th of July. Also the North Mississsippi Six Counties Medical Society which met in New Albany on the 21st of July. Both societies are very active, earnest, working units, and richly deserve highest commendation for the scientific programs offered on these occasions. Mississippi medicine is making progress. Let us "carry on."

The Forrest County Health Unit is doing a very satisfactory work. The county, the city of Hattiesburg, the physicians, and the Health Unit force are working harmoniously. Team work counts.

On July 20th, at a meeting held in Meridian, a temporary organization was perfected whereby the societies of the four counties of Newton, Neshoba, Winston, and Lauderdale were united into one to be called "The East Mississippi Medical Society." A new charter will be requested at the next State Medical meeting. Temporary officers elected were:

President—Dr. M. J. L. Hoye.

Vice-President—Dr. R. L. Minor, Lauderdale.

Vice-President—Dr. S. A. Majure, Newton.

Vice-President—Dr. W. R. Hand, Neshoba.

Vice-President—Dr. T. L. Kilpatrick, Winston.

Secretary and Treasurer—Dr. H. L. Rush.

The women of the Tri-County Medical Society will hold their September meeting in Brookhaven.

At the August meeting of the Jackson County Medical Society there was a rather small attendance but the discussion of a variety of subjects made it a good meeting.

Dr. J. N. Lockard, recently from Touro Infirmary, has located in Pascagoula and is now a member of the Society.

Dr. J. H. McLain attended the funeral of his sister at Gloster, Mississippi, and has just returned.

Dr. E. L. Posey is spending all of August visiting places of interest in the North and West.

Dr. H. R. Shands is spending a few weeks' vacation in the West.

Dr. R. W. Hall spent two or three weeks in Denver during August.

Dr. G. W. F. Rembert spent all of August in vacation and visited a number of clinics.

Dr. and Mrs. L. S. Gaudet spent their vacation, the latter part of August, in North Carolina.

THE ONLY WAY TO CURE THE NARCOTICALLY AFFLICTED.

In the "Mississippi Doctor" (Vol. 4, No. 1) appears an article, with the foregoing title, deserving of unusual attention. Space forbids its presentation in full. Dr. C. M. Shinault protests against the use of such terms as: addict, habitue, and doper. He proposes that the word "afflicted"

be used in this connection, for he believes that "it is something more than a habit." The use of such terms is degrading to the victim, and, too, it places him in a false and most undesirable standing before physician and laity.

The most important factor in a permanent cure is environment. The afflicted should be placed in an atmosphere charged with harmony and one free from worry. Shinault proposes that the treatment be divided into two parts. The first is the active removal of the drug and for this he states that "straight morphine reduction with aspirin for insomnia is the only rational treatment." But before attempting any removal of the drug the physical health of the patient must be restored as far as possible by the removal of all foci of infection. Every source of pain must be eradicated if success is to be had in removing the drug and the patient is to feel confidence in his ability to get along without the drug.

The second part of the treatment is environmental. He should be treated with patience and sympathy and should feel that he is still respected. All outside disturbing influence must be removed. Nothing should be expected of the afflicted except that he forget his troubles and enjoy himself. He should have congenial work and should be allowed to read the news and any literature desired. The environmental treatment should be continued for a year. The disrespect for the afflicted shown by the majority of people is an added burden to the sick mind and is often the cause of repeated transgressions.

CONTAGIOUSNESS OF CANCER.

Under this heading an editorial of the Journal of the American Medical Association (87:415, August 7, 1926) quotes from a French Journal on a case of accidental inoculation of malignancy in man. The case is presented as being the first authentic instance in which a medical attendant was infected by a malignant growth from a patient.

"The victim was a French medical student, who let fall a syringe with which he was aspirating fluid that had collected beneath the wound made in the amputation of a breast for cancer. The needle penetrated deeply into the palm of the student's left hand, and, as the syringe contained the cancer fluid, might well have discharged some of its contents into the deep tissues. The student cauterized the wound himself with a galvanocautery, and the immediate effects were slight. Nothing more was observed for two years, when there began to be some pain in the hand, followed by the development of a hard swelling at the site of the needle puncture. A month later the left axillary glands became enlarged and were removed. The growth in the hand enlarged and began to ulcerate, so that a diagnosis of an infective granuloma was made, and the tissue was removed about six months after the growth was first noticed. A month later subcutaneous nodules had appeared in the skin of the forearm, and the local growth recurred, establishing beyond doubt the malignant character of the process. Therefore the left upper extremity was removed by a shoulder joint disarticulation; six months later there were no evidences of recurrence of the growth.

"This history seems to be clear cut and, as far as known, the first one reported, of accidental inoculation of a medical attendant with cancer from a patient, and as such it is reported. But, unfortuntely or otherwise, the evidence is by no means convincing that this is a true instance of inoculation of cancer from man to man, for the reason that the cancer of the breast of the first patient was a carcinoma, composed of solid masses of epithelium in atypical arrangement; the growth arising in the hand of the medical student was a spindle cell sarcoma, not at all resembling the breast cancer. Had the growth that arose at the site of the needle puncture been a carcinoma similar to that of the breast, there would have been no room to doubt that it was an example of transplantation cancer in a human subject. But the sarcomatous growth that was present might well have arisen as a sequel of the needle trauma independent of the contents of the needle and the syringe, and this may be the correct explanation of the whole matter. Yet the fact that the growth in the hand was a sarcoma does not exclude the possibility that it was the result of implantation from the breast cancer, for in experimental transplantation of tumors in animals it has occasionally been observed that carcinomatous transplants may in time develop sarcomatous elements from their stroma which eventually entirely replace the carcinomatous elements. Such a change might have occurred in this case, although such a trasformation in a first implantation is extremely improbable. Or, one may argue that there was transmitted a cancer virus which has the capacity to produce either carcinoma or sarcoma, an hypothesis that will seem plausible to some, fantastic to others. At any rate, this case is by no means a proved instance of transplantation or inoculation of cancer from one person to another, for we have no possible way of determining that the sarcoma of the hand did not arise solely because of the trauma of the needle. The case is of great importance as being apparently the nearest thing to human cancer inoculation that has ever been observed, and it emphasizes anew the fact that cancer is not contagious of infection in any ordinary sense, since even the single possible exception does not fully establish itself."

BOOK REVIEWS

Infection and Resistance: By Hans Zinsser, M. D. Third edition. New York. McMillan Co. 1923.

An exposition of the biological phenomena underlying the occurrence of infection and the recovery of the animal body from infectious disease, with a consideration of the principles underlying specific diagnosis and therapeutic measures.

The third edition of this master work of one of the most eminent investigators and teachers of bacteriology and immunology in America, has been before the public too long to require more than a mere acknowledgment of its receipt and availability to the readers of the library of the Orleans Parish Medical Society which is the repository of all the publications presented to this Journal through the courtesy of the publishers.

In the preface to this third edition of his great classic, the author, in rewriting this treatise, has not only revised and added to the text of the previous editions the new acquisitions of the biologic and exact sciences which are constantly enriching the study and the literature of infection, resistance immunity and anaphylaxis, but he has made considerable alterations in the arrangement of the material in order to present it in the most logical sequence. The chapters on anaphylaxis have been completely rewritten. The final chapters on practical therapeutic methods and the theories upon which they are based, have been enlarged and rewritten with a purpose of making them more definitely useful to those engaged in the clinical and laboratory study of infectious diseases.

"While the hope is expressed that the book as rewritten will prove more useful than formerly to physicians, the public health workers and laboratory investigators, the author has adhered particularly to his original purpose, namely, the preparation of a critical treatise for the use of undergraduates, students of medicine and public health. He states: "We are more than ever convinced, from our experience in teaching such students, that immunology can be presented with sufficient clearness and simplicity to make it easily accessible to students at this stage of their careers, and that a thorough survey of the subject is almost indispensable to a proper subsequent approach of the problems of infectious disease." While we do not share the confidence of the author in the capacity of the average undergraduate to master the contents of the encyclopedic treatise such as this in the present overcrowded state of the medical curriculum, it cannot be questioned that the fundamental concepts of the great subjects so elaborately, learnedly and critically presented in this volume should be mastered at an early period of the student's medical career since no true understanding of what is basic in the scientific knowledge of disease and infectious processes is possible without such knowledge. The undergraduate should master the fundamental principles which are so lucidly expounded in this treatise, but it is only the teacher and special student of the subject who can absorb, grasp and profit intelligently by the review and critique of the vast mass of facts and theories which re-assembled and marshalled in exhaustive detail in the nearly 650 octavo pages of this masterly work.

From this point of view, Professor Zinsser's treatise is indispensable in the equipment of every laboratory worker in pathology and no medical library can be complete without it, since it embodies all that is best in the contemporary scientific knowledge and thought on the subjects discussed.

RUDOLPH MATAS, M. D.

The Nursery Guide for Mothers and Children's Nurses: By Louis W. Sauer, Ph.D., M. D. Second edition. St. Louis. C. V. Mosby Co. 1926.

This book was written "to aid those to whom are entrusted the care and feeding of infants." It is simply written so that any one can understand the directions. It is practical as well as scientific and would be a great help to any mother with young children. In the first two chapters, the author gives instructions to the mother about care of herself during pregnancy, and discusses some of the minor ailments of the new baby. He tells how to clothe, bathe and feed the baby, how to regulate its life so that it will form proper habits. In the third chapter he gives instructions for caring for the premature baby. In chapter four he tells how to prepare the baby's food and gives diets for the baby and for the older child. He also gives recipes for many simple foods for the older child. In the last chapter, he discusses minor ailments of children and gives simple instructions of how to treat them until the doctor has been called. It is a very good book to recommend to the young mother who is seeking help in the care of her child.

RENA CRAWFORD, M. D.

Pathogenic Micro-organisms: By William Hallock Park, M. D., Anna Wessels Williams, M. D., and Charles Krumweide, M. D. Eighth edition, revised. Philadelphia and New York. Lea & Febiger. 1924.

I have carefully reviewed the work of Drs. Park, Williams and Krumweide, on pathogenic micro-organisms and have found the book to be one of the most thorough on this subject. It is a wonderful contribution to both the medical profession and to the medical student. They cover each organism completely and their table on the identification of bacteria is very compact and very helpful to the laboratory worker.

A. V. FRIEDRICHS, M. D.

Parasites and Parasitoses of the Domestic Animals: By B. M. Underhill, V. M. D. New York. The MacMillan Company, 1924.

After scanning the well written and profusely illustrated compendium of the enormous number of parasitic protozoa—flies, mites and worms—that infest both man and our housemates in the form of pet animals one wonders why a munificent government would not make the various disseminators of knowledge regarding the cause of disease demonstrate some of their claims before using the mails to get new adherents to their various and sundry cults. Imagine perhaps the chiropractor so adjusting your pet dog's special spinal column that the 50 or 60 worms of several different varieties could no longer tolerate their surroundings and come bounding to the exterior of their delighted host, or, perhaps, the New Thought artist so emancipating the shackles binding down the mentality of our friend Bossie that, in the exuberant glow of a perfectly tranquil mind, the warble fly maggots coursing through her muscles would become petrified with fright at the changed conditions and proceed to melt away as if they were merely troubled dreams. Perchance the Christian Scientist would argue that as long as mind is superior to matter—and that matter is only a state of mind—could be induced before posting copies of the Monitor in the railway station to prove to the government that a flea bite is nothing after all—or that several feet of our pup's tapeworm whose eggs could hopelessly destroy a human liver, is nothing more than a conjecture.

Seriously speaking, however, this work by Dr. Underhill should be read by every physician. A large proportion of human diseases are parasitic in nature—they all have counterparts in the infestations of our domestic animals, and many of them are curiously interwoven in cycles of reproduction or growth in both man and animal. The book is well written—thoroughly illustrated with many of the illustrations from the U. S. Bureau of Animal Industry—and though now several years old is still up-to-date in fundamental concepts.

F. M. JOHNS, M. D.

Modern Methods of Amputation: By Thomas G. Orr, A. B., M. D., F. A. C. S., Kansas City. St. Louis. C. V. Mosby Co. 1926.

The author has presented a monograph that is brief and concise, but which covers the subject well. He stresses the simplification of amputation technic, the great importance of careful surgery in these cases, and keeps function as the foremost thing in the surgeon's mind.

Professor Orr has divided his little book into six chapters. These cover practically every phase of amputations. He presents an introduction to cinematiplastic amputations, about which little is known in America; and the principles which underlie artificial limbs and their fitting.

The brief and concise way in which the subject is presented makes this monograph an excellent little book; and one which can be read with interest and pleasure.

FRANK L. LORIA, M. D.

PUBLICATIONS RECEIVED.

Bruce Publishing Company, St. Paul: "The X-Ray Embryology and Obstetrics," by W. A. Newman Dorland, A. M., M. D., F. A. C. S., and Maximilian John Hubeny, M. D., F. A. C. R., F. A. C. P.

W. B. Saunders Company, Philadelphia and London: "Clinical Pediatrics," by John Lovett Morse, A. M., M. D.

C. V. Mosby Company, St. Louis: "Pathology and Treatment of the Inflammatory Diseases of the Nasal Accessory Sinuses," by Professor Dr. M. Hajek, translated and edited by Joseph D. Heitger, A. M., M. D., and Frank K. Hansel, M. D., M. S., Volumes I and II.

P. Blakiston's Son & Company, Philadelphia: "Elements of Pathology," by Aller G. Ellis, M. Sc., M. D. "The Diabetic Life, Its Control by Diet and Insulin," by R. D. Lawrence, M. A., M. D. "Medical Gymnastics and Massage in General Practice," by J. Arvedson, M. D., translated and edited by Mina L. Dobbie, M. D., B. Ch.

Lea & Febiger, Philadelphia and New York: "Fundamentals of Dermatology," by Alfred Schalek, M. D.

F. A. Davis Company, Philadelphia: "Electrothermic Methods in the Treatment of Neoplastic Diseases," by J. Douglas Morgan, B. A., M. D.